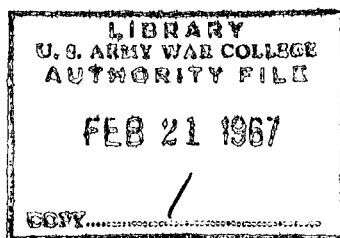


FM 1-110

DEPARTMENT OF THE ARMY FIELD MANUAL

ARMED HELICOPTER EMPLOYMENT

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ARMED HELICOPTER EMPLOYMENT

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CHAPTER 1

INTRODUCTION

1. Purpose

The purpose of this manual is to describe principles, tactics, and techniques of employing the armed helicopter in support of ground forces. Commanders and staff officers of aviation and ground tactical units should use this manual as a guide to insure effective employment of firepower from helicopters with the firepower of the combat unit being supported.

2. Scope

a. This manual provides basic information for the employment of armed helicopters in offensive, defensive, reconnaissance, security, and special operations. The information is founded on the combat experience of armed helicopter units.

b. The basic principles, tactics, and techniques described in this manual apply to all armed helicopters. However, specific application is to the UH-1 helicopter unless otherwise stated. This helicopter is equipped with an armament subsystem such as the XM3 area rocket, the M5 40mm grenade launcher, the M6 quad machinegun, the M22 antitank guided missile, or the XM16 (which combines the M6 quad machinegun subsystem and the 2.75-inch area rocket weapons system). These weapons subsystems are described and illustrated in appendix II with essential data; further details can be found in the training circulars listed in appendix I.

c. The material presented herein is applicable without modification to both nuclear and non-nuclear warfare.

d. Users of this manual are encouraged to submit recommended changes or comments to improve the publication. Comments should be keyed to the specific page, paragraph, and line of the text in which changes are recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. Comments should be forwarded direct to the Commandant, United States Army Aviation School, Fort Rucker, Ala. 36360.

3. Concept of Utilization of Armed Helicopters

The principles of employing armed helicopters are still in the formative stage. However, it is important that known and proven principles be taught and employed to full advantage. This will assure a common base from which new and improved principles and techniques can be derived.

a. The Army airmobile concept, employing organic Army aircraft, dictates a requirement for immediate, responsive fire support during airmobile operations. The armed helicopter has proven to be a suitable gun platform which can accommodate a variety of weapons responsive to the fire support requirements of the ground commander. By providing accompanying and readily available fire support, the armed helicopter increases the number of possibilities available to the ground commander to more effectively apply his combat power. Missions requiring movement into enemy-held terrain can be undertaken with greater probability of success when armed helicopters are an integral element of the airmobile force.

b. The concept of using helicopters in a fire support role visualizes their employment to supplement and extend the firepower available to the ground commander from ground based weapons and close air support. Armed helicopters are not intended as a substitute for the other fire support means. As the Army's capability for combat mobility is expanded, through the use of organic aircraft, the ability to provide fire support with organic aerial vehicles will also expand. Using appropriate tactics, the armed helicopter contributes greatly to mission accomplishment through its ability to operate in the same environment as the ground force. In addition, it possesses the capability to deliver effective suppressive fire in the objective area at a crucial point in airmobile operations. The number of armed helicopters used on a particular mission will depend upon the

airmobile capability allocated to the ground commander and the responsive fire support required. Employment concepts envision armed helicopters performing a variety of roles to include—

- (1) Escort.
- (2) Reconnaissance
- (3) Security.
- (4) Screening missions.
- (5) Deception.
- (6) Suppressive fire.
- (7) Delaying actions.
- (8) Raids.
- (9) Patrol actions.
- (10) Antitank operations.

c. Armed helicopters play an essential role in augmenting the ground commander's capability for mobile and nuclear warfare. This role is emphasized in those instances where great dispersion of ground forces is required. The close and quick-reacting fire support that the armed helicopter can provide the ground or troop lift commander per-

mits him the widest possible latitude in the assignment of missions to airmobile forces.

4. Capabilities of the Armed Helicopter

Armed helicopters can engage in offensive, defensive, reconnaissance, security, and special operations, thereby facilitating the attainment of the ground objective. The armed helicopter provides—

a. Responsive aerial firepower against personnel and materiel on area or point type targets.

b. Extension of the reconnaissance and security capabilities of ground units.

c. An additional means of adjusting indirect fire from field artillery and naval guns.

d. An additional means of target acquisition, target fixing, and the means for initiating requests for close air support by Air Force, Navy, and Marine attack aircraft. Armed helicopters can be used to augment the striking force and to evaluate strikes subsequent to the attack.

e. Escort to other helicopters.

CHAPTER 2

EMPLOYMENT PRINCIPLES AND PROCEDURE

Section I. PRINCIPLES OF EMPLOYMENT

5. Fundamentals of Employment

Armed helicopter units support infantry, armored, mechanized, and airborne infantry units by responsive delivery of aerial firepower where it is needed. Command relationship as contained in FM 1-15 must be established prior to committing the armed helicopter force. The commander of an armed helicopter unit, with knowledgeable understanding of the tactics and employment of each type ground unit with the plan of action of the ground force, recommends the best utilization of his unit in support of this plan. Based on the final decision of the force commander, he then executes his portion of the plan. The nature of his integrated tasks requires boldness and aggressiveness in the execution of his plan.

a. Surprise. Surprise is achieved by using the speed and maneuverability of the helicopter in crossing terrain obstacles to strike the enemy at an unexpected time and from an unexpected direction. It is augmented by well-executed aerial movements at low level, when necessary, using available cover and concealment and with all speed, aggressiveness, and deception possible.

b. Fire and Maneuver. Combining fire and maneuver as a singular principle, armed helicopters engage the enemy with a persistence that both distracts his aims and undermines his confidence. Armed helicopters using a continuous harass-and-exploit technique can have a damaging psychological effect on the enemy and may prove as destructive to his morale as the loss of men and equipment from helicopter fire. Such engagements employ two common features of warfare—a *base of fire* and a *maneuvering force*. The base of fire is the element that will restrict the enemy's ability to maneuver during the engagement while attempting to destroy him. The maneuvering force is the element that will in fact attack and destroy him by fire. Target characteristics and the standoff distance necessary to avoid effective coun-

terfire will determine the type armament needed by each of these helicopter elements for a given engagement. Their roles may be interchanged when the maneuvering force completes its task and becomes the new base of fire while the old fire element becomes the new maneuvering force.

c. Mobility. The rapidity of armed helicopter unit movement over obstacles, the maneuver of their firepower into position to destroy the enemy, the rapid concentration and prompt dispersal of fire elements, and the ease of convergence on a single objective from several directions permits the employment of concentrated firepower in the objective area concurrent with the maneuver of ground combat elements. The inherent capability of the helicopter to overfly terrain obstacles permits the assignment of multiple tasks to these units and their rapid disengagement once committed. Therefore, the armed helicopter unit commander at every level should expect diversity of task and should be prepared with all plans and details necessary to overcome or avoid terrain obstacles and restrictions to movement in the combat area. That is, his planning must be continuous and encompass as a minimum such factors as friendly or enemy fires, good and poor weather conditions, the state of materiel readiness, and personnel strength.

d. Flexibility. Mobile warfare dictates that combatants be capable of adapting their actions to fluid and rapidly changing situations on the battlefield. Armed helicopter units, because of their excellent means of communications, high degree of mobility, and variety of weapons, are ideally suited for operations in this environment. They are adaptable to rapid changes in attack formations and other engagement techniques during a single encounter with the enemy. It is imperative that an armed helicopter mission commander keep himself and his superiors well informed and be able to modify his plans to contribute to the suc-

cess of the overall mission. Mission-type orders best permit flexible response to changing conditions and permit the mission commander to modify his plans as the situation dictates.

e. Coordination. The potential of the armed helicopter is best realized when employed in conjunction with the ground and air combat elements. Armed helicopters alone are not capable of holding terrain. When employed with conventional forces, they provide mobile firepower at critical times and places to augment and extend the fire support capability of the ground commander. All operations should be coordinated to the fullest extent possible among all participating units.

6. Factors Affecting Employment

a. General. Factors affecting employment of armed helicopters are mission, enemy, terrain and weather, and troops and equipment (METT). Commanders first consider each factor separately. They then mentally weigh each factor in the light of the importance of the other factors pertaining to the specific mission. In many situations, the relative importance assigned to each factor of METT will determine which course of action will be selected. The armed helicopter unit and mission commanders consider all factors in relation to the unique equipment and mission capability of the unit.

b. Mission. The mission of an armed helicopter force falls within the mission assigned to higher headquarters and dictates the broader employment aspects of armed helicopter units. The mission, with its stated and implied tasks, will always be the overriding consideration of the commander. The armed helicopter, suitable for offensive or defensive operations, is particularly well suited for the attack (para 29).

c. Enemy.

- (1) *Available information.* All available information of the enemy location, strength, disposition, composition, and habitual employment is obtained prior to commitment of armed helicopter units. The collection of information is continued throughout the conduct of the operation in order to furnish the force commander accurate and timely information for his continuing estimate of enemy capabilities and dispositions. Methods for obtaining enemy information include reports from units in contact; air ob-

servers and aerial photos; PW's, refugees/civilians; liaison with adjacent units; ground and air reconnaissance patrols; and intelligence provided by higher headquarters. Reconnaissance in force may be employed to provide additional information; however, any employment of the armed helicopter for a reconnaissance in force risks loss of surprise in the ensuing operation and must be coordinated with higher headquarters. For further information on combat intelligence, see FM 30-5 and 30-7.

- (2) *Capabilities.* An armed helicopter unit will be of high priority as a target for enemy tactical air forces. All forms of deception, cover, dispersion, concealment, and types of movement are important to survival of the helicopter. The enemy capability of employing airborne or air-mobile forces and of employing his firepower to counter the employment of armed helicopter units is of vital concern to the mission commander. Factors to be considered are—

- (a) Number and type of weapons possessed by or available to the enemy, and location and disposition of enemy weapons and their possible fields of fire.
- (b) Characteristics of enemy weapons; e.g., range, target acquisition means (visual or electronic), rate of fire, mobility, elevation limits, and their relative effectiveness against aircraft (to include enemy unit effectiveness, if known).
- (c) Vulnerability of enemy weapons to armed helicopter firepower.

d. Terrain and Weather. The terrain and weather are important factors in armed helicopter operations. The armed helicopter mission commander must determine his advantages from the terrain, and evaluate the advantages it affords the enemy. Conditions of relatively low visibility and ceiling are ideally suited as a cover for helicopter operations.

- (1) *Terrain and avenues of approach.* In selecting approach routes, major considerations include the achievement of tactical surprise and an effective attack on the target. Favorable flight routes pro-

vide defilade and ease of navigation. The obstacle-producing effects on avenues of approach by nuclear weapons should be considered. Areas with heavy foliage provide good routes since ground troops have little opportunity to see or fire at low-flying helicopters. Ridges provide defilade, reduce the possibility of detection by radar, and reduce the range of helicopter noise. Downdrafts in steep defiles or canyons will adversely affect the flight characteristics of armed helicopters. All avenues of approach are considered. The use of less obvious or otherwise less desirable avenues of approach may achieve a degree of surprise that offsets any disadvantage. The best possible avenue of approach is determined by—

- (a) *Probable locations of enemy positions.* Study of the terrain and knowledge of enemy order of battle will disclose probable locations for enemy positions.
- (b) *Enemy observation.* Enemy observation posts that afford unrestricted observation of the flight route should be neutralized by fire (artillery or tactical air strikes) or screened by smoke.
- (c) *Concealment and cover.* *Concealment* is protection from enemy observation; *cover* is protection from fire. Every advantage afforded by the terrain and conditions of visibility that provide concealment and cover must be exploited by the armed helicopter. Concealment and cover are essential in masking the assembly or staging areas, loading zones, and landing areas for armed helicopter operations, as a means of protection against direct fires, and as an aid to tactical cover and deception during the attack. However, concealment and cover should not be sought at the expense of good observation and accurate fire. Countermeasures against the enemy's advantages of cover and concealment should be persistent, and measured to assess their value or need for changes in operational procedures.
- (d) *Armed helicopter fields of fire.* Good fields of fire, essential to the effective employment of direct fire weapons, are

selected for the particular weapons to be used on the armed helicopter mission in the specific objective area.

- (e) *Key terrain.* Key terrain is any locality or area the control of which affords a marked advantage to either combatant. It must be seized, neutralized, or otherwise controlled to deny its use to the enemy for the duration of the attack. It influences every consideration listed here that is critical to the successful employment of the armed helicopter unit. In restricted terrain such as jungle and mountainous areas, key terrain for armed helicopter units may also include terrain suitable for rearming and refueling areas, LZ's, and operational bases.
 - (f) *Obstacles.* Obstacles may be natural terrain features, manmade obstructions, or obstructions created by chemical and nuclear fires. The armed helicopter, limited only by range and altitude considerations, can successfully avoid obstacles which would ordinarily hinder or prevent the surface movement of combat forces.
- (2) *Weather.* Weather conditions will have an important bearing on any operational decision and should be a primary consideration in mission planning. Weather conditions seldom preclude low-level operations for extended periods of time.
- (a) High winds, icing, and periods or areas of low visibility must be considered by the armed helicopter unit commander. In turn, he must keep his subordinates informed of likely weather conditions in the target area, and adopt procedures to reduce the adverse effects of poor weather. High winds and cross winds in particular, will affect the accuracy of rockets fired from helicopters. Variations in density altitude may limit the armament ammunition, or fuel load that the armed helicopter can carry.
 - (b) The weather forecast, which includes sunrise, sunset, moonrise, and moonset, will determine the length and type of operation which can be undertaken. Weather conditions may prohibit or

limit some phases of an operation. Often the surprise gained by armed helicopter operations during unfavorable weather offsets the limitations and difficulties which may be encountered. Reduced visibility increases the target acquisition problems for the armed helicopter force; however, once the target has been acquired, the armed helicopter mission commander may use the adverse weather to hinder enemy observation of his attacking elements.

- (c) The armed helicopter mission commander should consider the advantage of attacking from out of the early morning or late afternoon sun. This technique in the attack is effective against visually directed enemy weapons fire. However, an attack into the early morning or late evening sun will greatly decrease visibility from aircraft.

e. *Troops and Equipment Available.*

- (1) *Timely logistical support.* Timely logistical support, critical to the successful accomplishment of all armed helicopter missions, requires detailed planning for resupply, evacuation, and maintenance before the operation. Logistical estimates and plans are revised as necessary to sustain the fighting capacity of the unit throughout the operation.
- (2) *Capabilities of available forces.* Having been assigned a specific tactical mission, the force and helicopter unit commanders must consider all fires available and request support by those elements that can most effectively assist in accomplishment of the mission. When available, artillery, tactical air support, naval gunfire, and ground combat elements must be considered (para 14 through 18). The

armed helicopter unit commander's plans depend in part upon the capabilities of his own force and those of other supporting forces. The capabilities of the armed helicopter forces are dependent upon—

- (a) Number of armed helicopters or armed helicopter units.
 - (b) Type units or armament configuration of each helicopter.
 - (c) State of training, both ground crew and air crew.
 - (d) Physical readiness and morale of crews, both ground and air.
 - (e) Strength in men and equipment.
 - (f) Previous, present, and contemplated employment.
 - (g) Present location and disposition.
 - (h) State of maintenance and supply (classes III(A) and V(A)), to include location of servicing areas.
 - (i) Adequacy of combat and combat service support.
 - (j) Capabilities and limitations of the commanders.
- (3) *Economy of combat power.* Economy of combat power is an important consideration in the employment of armed helicopters. Armed helicopters carry a limited ordnance load; this ammunition must be expended wisely, in the appropriate amounts, to accomplish the specific mission. Armed helicopter commanders must decide which weapons are required against specific targets. One method of ammunition control is to designate specific loads and types of ordnance for particular missions. Another method is to prescribe a certain percentage of the ammunition load that will not be expended without permission of the mission leader.

Section II. TROOP-LEADING PROCEDURE

7. General

Troop-leading procedure is the planning process and sequence of actions which the armed helicopter unit commander follows while preparing for and executing assigned missions. He must make the best use of time, equipment, and person-

nel. The sequence of the troop-leading procedure may vary depending on the size of the unit, nature of the mission, and time available. Certain procedures may be undertaken concurrently, and some are considered continuously throughout an operation. For a detailed discussion on troop-leading procedures, see FM 101-5.

8. Action Upon Receipt of Mission

a. Analysis of Mission. The assigned mission should be studied to insure complete understanding and to determine what stated or implied tasks must be performed to accomplish it.

b. Time. Time is one of any commander's most important considerations. Armed helicopter unit commanders must allow their subordinates maximum time for planning. Sufficient time should be allocated to subordinates to perform their own troop-leading procedures. Consistent with the situation, this time allowance should permit thorough preparation and timely execution of the mission. If subordinates lack the time to make adequate preparations, even the best plan may not be executed properly. Unit SOP's and unit training will reduce reaction time and will insure attention to all areas of the mission. Individuals within the unit should be assigned specific duties that they are habitually responsible for, with necessary guidance for performing these duties without additional orders or instructions.

9. Warning Order

Subordinates should be alerted that an action is anticipated. The warning order allows the helicopter unit time to make SOP preparations such as performing maintenance, boresighting weapons, checking radios and individual equipment, and distributing ammunition, fuel, and other supplies. These tasks are supervised by the mission commander, aircraft commanders, and crew chiefs and though normally accomplished during past flight inspection, may require special consideration in light of the mission at hand.

10. Estimate of the Situation

Before making a decision, the armed helicopter mission commander should make a logical and orderly examination of all factors affecting the accomplishment of his mission. The estimate of the situation is based on the initial evaluation of information available; for example, information of the terrain may be gathered from a map reconnaissance (as a minimum). The estimate is a continuous process of evaluation before and throughout the operation and is revised as more information becomes available.

11. Tentative Plan and Completion of Plan

Based on the decision from the initial estimate, the armed helicopter mission commander makes a

tentative plan which guides his action and the actions of his subordinates. The tentative plan and decision may be modified after coordination and reconnaissance, before a final decision is reached. The completed plan is the result of reconnaissance and of recommendations from subordinate commanders and supported unit representatives. The completed plan includes—

a. Coordination. Coordination insures that all tasks are clearly understood and that there is no conflict between units. To resolve details, operation plans are coordinated with all supporting or supported units.

b. Movement of Unit. The initial order may require deployment of the armed helicopters to a designated staging area prior to conduct of the mission. Movement plans are as detailed as necessary to accomplish the purpose. They normally include who is to move, where they are to go, and when and how the move is to be made.

c. Reconnaissance. The reconnaissance must be planned to make the best use of the time and resources available. The armed helicopter leader should take full advantage of helicopter mobility to expedite conduct of his reconnaissance. Maps and aerial photos will be used to supplement the reconnaissance. During his reconnaissance, the armed helicopter unit commander continues the estimate process, adjusting his tentative plan accordingly, and selects his course of action. He coordinates with supporting and supported unit commanders as required. Extreme care or deception must be exercised in reconnaissance of landing zones to prevent disclosure of intent to the enemy. If possible, reconnaissance and photo flights should be established throughout the entire area of operation on a continuous basis.

d. Time and Location for Issuance of Order. A plan for issuance of the order must be made. If subordinates cannot be assembled at a single location to receive the order, it may be issued by radio, messenger, or other rapid means of communications.

e. Decision and Completion of Plan. The final decision and the completed plan are based on the analysis of all previous actions and factors. The completed plan is continuously updated to keep it current with the changing situation.

12. Order

The order must be clear, concise, and complete to insure that the mission is understood. It should allow sufficient freedom of action for the mission commander to make necessary modifications to the plan in order to accomplish the mission (app. V).

13. Supervision

The armed helicopter mission commander, assisted by his subordinate leaders, actively supervises the unit to insure that the order is carried out successfully. Any deficiencies or misunderstandings are noted, and immediate corrective action is taken.

CHAPTER 3

COMBAT AND COMBAT SERVICE SUPPORT

Section I. COMBAT SUPPORT

14. General

The coordinated employment of armed helicopters augments to the maximum degree fire support from other combat elements. Armed helicopters operating at low level are subject to concentrated enemy ground fire and require the habitual use of responsive fire support and covering fires to enhance mission success and helicopter survival. Combat and combat support elements that provide such support include those furnishing artillery fire, naval gunfire, combat troops, and tactical air support. The armed helicopter unit commander must closely coordinate his employment with these elements in accordance with their capabilities and the mission of his unit.

15. Artillery Fire Support

Artillery fire support provides powerful means of influencing the success of armed helicopter missions. To make effective use of this support, the mission commander must be familiar with artillery capabilities, tactical employment of artillery, and the means by which artillery fires are to be obtained. For a detailed discussion of field artillery tactics and techniques, see FM 6-20-1 and 6-20-2. The armed helicopter mission commander must know the location of the artillery units, whether they can provide support, priority of fires, and the type of fire they can deliver. This information must be disseminated to all aircraft commanders. If artillery fire can be used to support the mission—

a. The armed helicopter mission commander will coordinate with the fire support coordinator or representative for preplanned and on-call concentrations, and arrangements for observation and adjustment of artillery fire will be established.

b. Radio frequencies, call signs, and authentications will be obtained by the mission commander for requesting artillery fires as necessary.

c. Alternate means of communications will be

established, to include the use of pyrotechnics if helicopter radios cannot make contact with artillery units.

16. Naval Gunfire Support

If naval gunfire support is available, the mission commander will coordinate with the air and naval gunfire liaison company (ANGLICO) representative to plan concentrations, coordinate radio frequencies, call signs, and authentications necessary to obtain this fire support (para 42).

17. Infantry/Armor Troop Support

Infantry/armor support is usually in the form of a maximum rate of fire by friendly ground elements during the disengagement of the last attacking elements of the armed helicopter force and facilitates the effective disengagement of the attacking elements. See FM 17-1 for a discussion of armored unit employment techniques. For infantry unit tactics, see FM 7-10, 7-20, and 7-30.

a. Coordination. Armed helicopter mission leaders will coordinate with ground troop commanders for fire support from their ground elements.

b. Location of Friendly Forces. Each armed helicopter mission commander, and all personnel who fire weapons from helicopters, must know the location of all friendly forces in the mission area, their radio frequencies, call signs, authentications, and visual recognition signals. This establishes the location of safe areas for emergency landings in the forward battle zone, affects the mission commander's choice of attack patterns, and assures the safety of friendly ground forces from armed helicopter fire. Lines of contact must be identified at all times by audio or visual means.

18. Tactical Air Support

Tactical air support consists of close air support, tactical air reconnaissance in areas of concern to the mission commander, and tactical air transport.

When close air support is available, a forward air controller (FAC) (an Air Force officer) is normally provided to ground elements. The FAC advises the ground commander on employment of tactical air support. Close liaison should be maintained between the forward air controller and the armed helicopter units. An FAC may physically accompany an armed helicopter force to insure close and continuous teamwork during complex strikes or during semiindependent operations.

a. Missions. Missions that may require supporting tactical air include prestrike of the armed helicopter target area, tactical air cover and re-

connaissance for the helicopter formation, neutralization or suppression of enemy strong-points, and attack of critical targets that are out of weapons' range or beyond the weapons' capabilities of armed helicopters.

b. Coordination. The armed helicopter mission commander will coordinate with the tactical air support representative to insure a mutual understanding of the method of requesting fires, target priorities, target assignments, emergency procedures, communications frequencies and authentication, target marking, and the armed helicopter and air support tactical plans.

Section II. COMBAT SERVICE SUPPORT

19. Supply

a. General. The servicing area may be located within the staging area, at the home heliport, or as an area by itself. Its location with respect to the mission area is of paramount importance to the armed helicopter unit. The flight time from the servicing area to the battle area will determine the duration of on-target time. The time required to refuel/rearm and return to the target area will be a governing factor in continuous support. Security of the area is a major consideration. When necessary, arrangements are made for ground security forces to protect this area. Within the site, helicopters may be parked in a defensive configuration as shown in figure 1 or modified depending on the terrain, weather, enemy capabilities, and friendly troop positions (fig. 2). Crewmembers from the armed helicopter force should occupy positions as shown in figures 1 and 2 to cover gaps or be deployed on a perimeter to protect the aircraft from hand thrown grenades. The defensive parking of aircraft reduces vulnerability to enemy fires, allows a faster reaction time, uses helicopter weapons to the maximum, and permits tactical servicing. A percentage of the armed helicopter force must be designated for immediate employment to defend the area. Unit SOP's supplemented by a current operation order must include actions in this area, including security measures to be taken by elements of the armed helicopter force.

b. Petroleum, Oils, and Lubricants (POL). The armed helicopter mission commander must arrange for prepositioning of POL in the area. Helicopters will be dispersed in the area as terrain and security requirements dictate. Since time is

an important consideration in a refueling operation, the most rapid refueling devices available should be positioned with the fuel. The armed helicopter mission commander will request necessary security elements to guard the POL site. Servicing must be sequenced so as to provide an immediately responsive element of the force to protect the area. Depending on the imminence of attack, states of readiness will range from keeping aircraft over the area to aircraft running on the ground, crews manning stations in aircraft, or crews and aircraft designated for possible employment.

c. Ammunition. The mission commander should make the following arrangements for ammunition:

- (1) Preposition ammunition in the servicing area. Ammunition loads for each helicopter should be stacked at its parking location.
- (2) Insure that rocket ammunition is properly assembled and ready to load.
- (3) Prepackage ammunition in the configuration that will insure the most expeditious reloading.
- (4) Arrange for prepositioning of such ammunition as screening and signaling smokes, incendiaries, and flares.
- (5) Insure that crewmembers are trained to reload helicopter weapons subsystems in the most expeditious manner.

d. Rations. All rations and water should be prepositioned for consumption while servicing is accomplished. Once the tactical operation begins, the time available for eating is limited. Rations prepared for immediate consumption should be

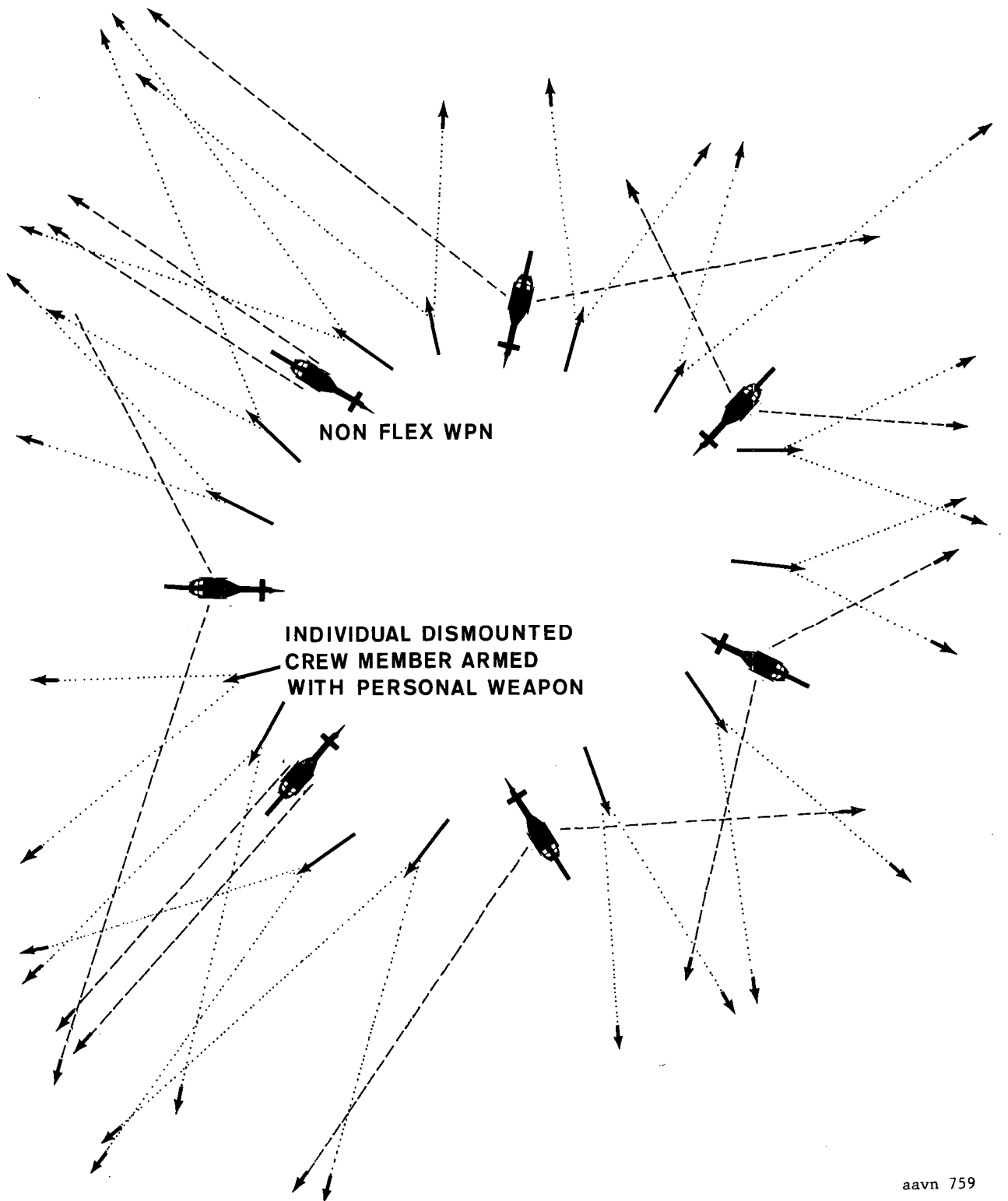
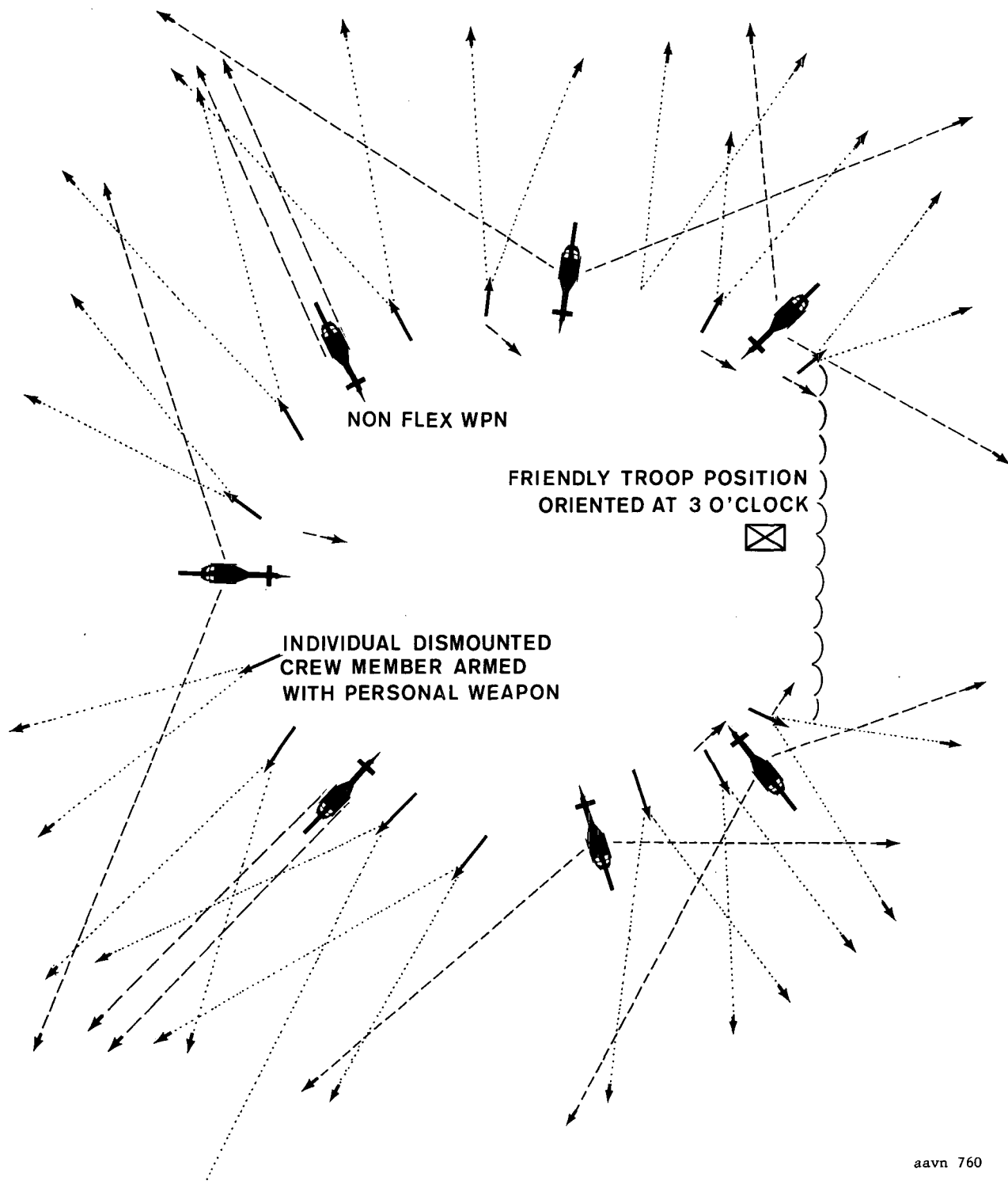


Figure 1. Perimeter defensive parking without attached troops.



aavn 760

Figure 2. Perimeter defensive parking with attached troops.

stocked within the servicing area. Time permitting, every effort should be made to serve hot rations to the flight crews.

20. Medical Service

a. Prior to tactical operations, the locations of aid stations and medical facilities in the combat area must be disseminated to all flight crews. Medical personnel should be made available in the staging areas.

b. The unit commander must insure that all crewmembers are proficient in first aid application emphasizing the restoration of breathing, stoppage of bleeding, prevention of shock, use of morphine, and emergency immobilization of fractures. Medical supplies to be carried aboard each helicopter will be dictated by command policy.

c. After expenditure of ammunition and if the mission permits, the armed helicopter mission commander may order armed helicopters to perform medical evacuation within the passenger-carrying capability of the helicopter.

d. Medical evacuation helicopters and crews may be attached to or placed in support of the armed helicopter force during semi-independent operations. In addition, these helicopters may be used for rescue of downed crews. Coordination with medical evacuation crews should be effected prior to the operation.

21. Maintenance Service

Special maintenance and supply considerations for armed helicopter operations fall into two categories: (1) The equipment that must be carried aboard each helicopter to maintain the weapons

subsystem and the helicopter and (2) the equipment and supplies that must be prepositioned at a servicing or staging area to provide for anticipated support of a specific tactical operation. Only those personnel and that equipment essential for mission accomplishment should be moved to the staging area. This will alleviate unnecessary congestion in the staging area and insure maximum utilization of support personnel and equipment. More detailed support will be located at the unit's tactical base field (FM 29-22). When planning for this support, the unit commander should consider the following:

a. Personnel and Equipment Requirements. Initial and subsequent combat requirements of personnel and equipment based on the type mission and the duration of the operations.

b. Helicopter Load Capacity. Capacity of armed helicopters to carry spare weapons and aircraft parts, weapons and aircraft lubricants, and hydraulic fluids or other POL items for use on the individual helicopters.

c. Tactical Field Maintenance. Location of aircraft, armament, and avionics mechanics in servicing or staging areas to perform critical maintenance tasks. Arrangements must be made for prepositioning maintenance and supply resources at the staging area for use by these personnel. When possible, component or modular replacement techniques should be used.

d. Resupply and Security of the Logistical Elements. Supplies and security for the servicing or staging areas are provided by the supported unit or higher headquarters.

CHAPTER 4

RECONNAISSANCE AND SECURITY OPERATIONS

Section I. RECONNAISSANCE OPERATIONS

22. General

a. Reconnaissance. Effective reconnaissance provides much of the information concerning the enemy, terrain, and weather essential to the conduct of operations. Armed helicopters when employed in conjunction with conventional ground reconnaissance elements extend the overall reconnaissance effort. The force G2 will coordinate the entire reconnaissance effort and formulate reconnaissance and surveillance requirements within the force area. Reconnaissance is a continuous effort by every crewmember of the armed helicopter element. Although a specific mission may not be stated as a reconnaissance task, it is an implied task in every mission. During reconnaissance operations, armed helicopters will engage in offensive actions only as required to accomplish the primary mission.

b. Timely and Accurate Reports. Unit training, combat SOP's and the unit commander's guidance to subordinates must emphasize the importance of timely and accurate reports of positive and negative information of the enemy and the area of operations. Reports will contain facts, not opinions. Information is usually reported as it is obtained.

c. Use of Information. Intelligence produced from the evaluation of reconnaissance reports is used by the unit commander in the planning and conduct of combat operations. Reconnaissance information and the resulting combat intelligence will reduce the unknown aspects of the enemy and the immediate area of operations, thereby contributing to the successful application of combat power.

23. Principles of Reconnaissance

Reconnaissance operations vary with the situation, conditions in the area, and with the size, types, and composition of the unit performing the mission. Armed helicopter reconnaissance opera-

tions are performed in accordance with the following principles:

a. Orient on the Reconnaissance Objective. Armed helicopter elements performing reconnaissance must maneuver according to the location or movement of the reconnaissance objective. This objective may be stated as enemy troops, terrain features, or a locality. The unit performing the reconnaissance must be allowed maximum freedom of action.

b. Report All Information Accurately. Reconnaissance is conducted to obtain information for the production of useful combat intelligence. To be of value to commanders at all echelons, this information must be timely and accurate, and include *what, when, where, and doing what*. The crews of armed helicopters conducting reconnaissance missions must report all positive or negative information rapidly and accurately. The use of a reconnaissance spot-report format will facilitate the rapid transmission of essential information. Unit SOP's should include a spot-report format. The mission is not complete until information gathered is properly reported.

c. Avoid Decisive Engagement. Armed helicopters performing reconnaissance missions will engage the enemy *only* if it is necessary to accomplish the mission, or if it is unavoidable.

d. Maintain Contact With the Enemy. In the performance of a reconnaissance mission, visual contact with the enemy is gained as soon as possible. Once contact has been made, it is maintained and normally is not broken without authority from higher headquarters. Continuous contact may be difficult to maintain and the assistance of ground reconnaissance elements may be required. The armed helicopter mission commander will coordinate with ground elements before initiating the mission.

e. Develop the Situation by Offensive Action. When enemy contact is established, the situation

should be developed quickly by limited offensive action unless restricted by the mission. The enemy's location, strength, composition (to include major supporting weapons in the immediate area), and disposition are determined, with special effort being made to determine the flanks of his position. Reconnaissance by fire normally will be employed in this mission. Armed helicopters may be assigned the mission of armed reconnaissance and neutralization of small enemy targets. Should it become necessary for ground forces to complete the mission, the armed helicopter mission commander will request such support. A detailed discussion of ground and air reconnaissance elements, operating as a team, is contained in FM 17-36.

24. Types of Reconnaissance Missions

There are four types of reconnaissance missions—*route*, *zone*, *area*, and *special*. Armed helicopter units may conduct reconnaissance missions in support of both ground and aviation elements. The type reconnaissance mission to be employed is determined after consideration of the information desired, where the information is to be sought, known enemy situation, terrain, size of the reconnaissance force, and the time available for obtaining the information.

a. Route Reconnaissance.

- (1) *General.* Route reconnaissance is the directed effort to obtain information on the route, obstacles, and enemy along a specific route and the terrain adjacent to the route which, if occupied by the enemy, would affect movement along the route. Route reconnaissance may be assigned to obtain information of a specific route or of an enemy force moving generally along a specific route. When intelligence indicates that the enemy is moving on one or more routes, or when terrain features canalize his advance, these routes should be reconnoitered to obtain enemy information. Routes of advance or flight routes may be reconnoitered when specific information of the route is required for the movement of friendly forces. Detailed route reconnaissance normally will be performed in conjunction with ground reconnaissance elements, especially when the route traverses densely vegetated or built-up areas.

(2) Formations and techniques.

- (a) A map study of the route will be conducted prior to an armed helicopter reconnaissance mission. Aerial photographs will supplement this study when available.
- (b) The armed helicopter element normally will carry a general mixed load of weapons and ammunition with adequate firepower to conduct armed reconnaissance. When enemy armor is anticipated, the element and its ammunition load should be tailored to meet this particular threat.
- (c) Prior coordination for artillery and Air Force assistance to provide on-call fires or close air support should be made. This coordination will include the type and amount of firepower available, communications frequencies and call signs, and methods of target marking.
- (d) The air formation used by armed helicopters will be governed by the factors of METT, as discussed in paragraph 6 *a* through *d*.
- (e) The leading armed helicopters should be armed with mixed weapons (rocket/machinegun subsystems) and reconnoiter the main route in a staggered fire team formation to cover each side of the route (fig. 3). During the mission, they will act as scout fire teams employing reconnaissance by fire as required. If critical terrain features, suspect areas, or lateral routes require closer examination, the scout fire teams leave the formation on order, reconnoiter the designated areas, and return to the formation. The remainder of the armed helicopter force, normally mounting heavier ammunition loads and antitank weapons, continues the movement and reconnaissance along the primary route. The heavy weapons elements are prepared to support the scout fire team at all times. The mission leader will direct the reconnaissance effort by the use of fragmentary orders, and will maintain close contact with ground reconnaissance elements.
- (f) When moving along a route, a distance from the route and an altitude which

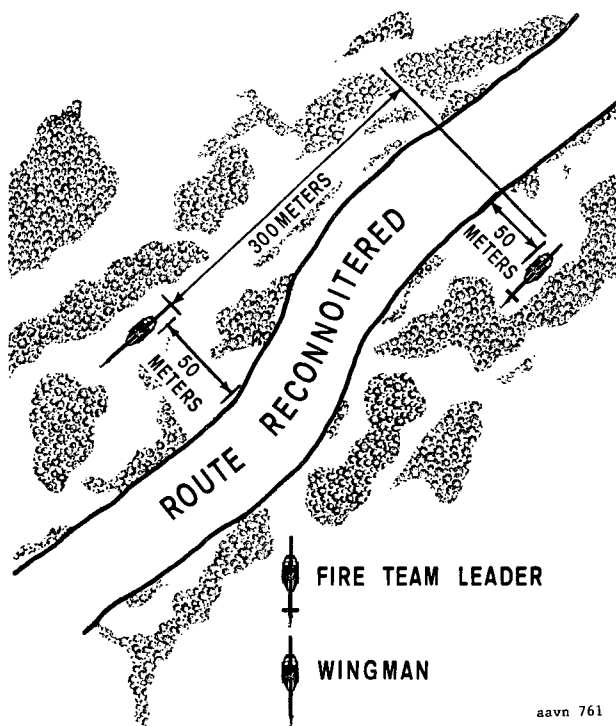


Figure 3. Leading fire team performing route reconnaissance.

allows the best reconnaissance of the route should be used. This distance and altitude will vary according to the factors of METT. Particular attention should be given to flightpaths offering best observation of the route, mutual fire support, and avoidance of overflying the enemy's most likely positions. The flightpath should vary to preclude establishing a set pattern which can easily be predicted by the enemy.

- (g) Dominant terrain within small arms range of the route should be reconnoitered immediately prior to passage of the column to prevent enemy observation and fire.
 - (h) Easily recognizable checkpoints should be used for control throughout the route reconnaissance.
 - (i) The initial actions upon contact with the enemy must be planned and understood by all elements. As the situation develops, the mission commander will issue fragmentary orders to accomplish the assigned mission.
- (3) *Sample situation.*

- (a) Figure 4 is an example of an armed helicopter force performing a route reconnaissance. As the scout fire team A approaches Hill 775, it will be designated to check the hill for possible enemy positions. The fire team leader will examine the terrain feature as directed. Distances between helicopters will vary so as to maintain mutual support consistent with the terrain and enemy situation. Fire team B will then assume the role of initial scout fire team along the route. After fire team A has reconnoitered Hill 775, it will assume fire team B's former position in the staggered column. Fire team C will carry heavy ordnance and will not normally be used as a scout element. The reconnaissance force may use any combination of task or alternate assignments that will accomplish the mission with speed and accuracy. Hill 540 may have been reconnoitered by fire team A if no delay was anticipated by the mission commander, and if it presented no immediate threat to the mission. As the following elements of the armed helicopter force passed Hill 540, they would confirm the security of the hill. If Route Red is designated an alternate route, fire team B could be dispatched to check this route by departing from the column at Checkpoint 26. The mission commander and fire team C would then deploy to a position from which rapid support could be provided to either fire team A or B, but would assume this position along primary Route Blue in order to supplement the reconnaissance of fire team A.
- (b) Figure 5 shows a scout fire team performing route reconnaissance through a wooded area. Mutual support may be temporarily sacrificed in order to accomplish the mission, but note that mutual fire support is regained after arrival at possible enemy strong points. The suspect area is thoroughly investigated while approaching probable enemy positions from the rear; if no contact is established, the reconnaissance continues as before.

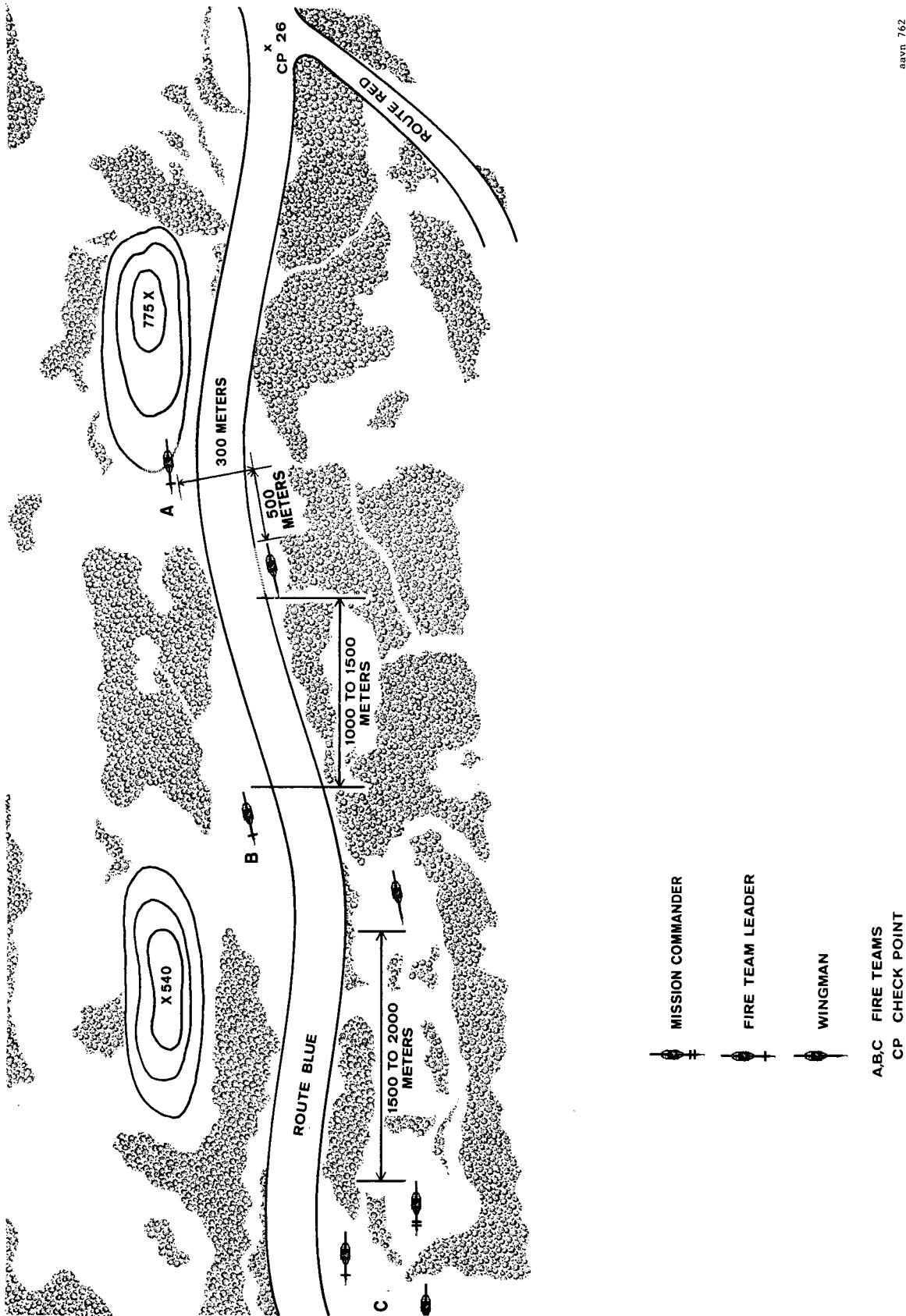


Figure 4. Route reconnaissance by an armed helicopter force.

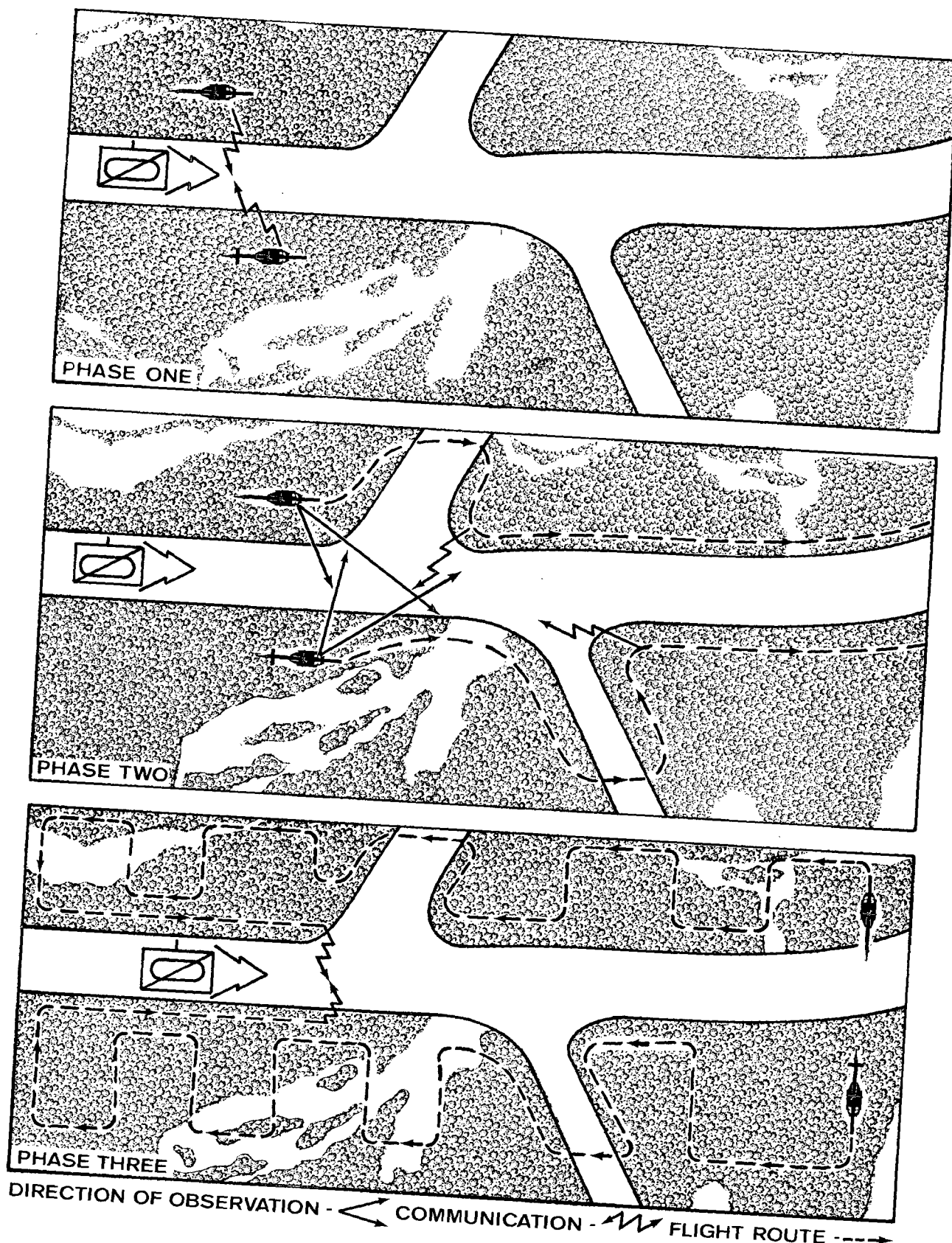


Figure 5. Scout fire team reconnoitering critical route intersection in wooded area.

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b. Zone Reconnaissance. Zone reconnaissance is the directed effort to obtain detailed information of all routes, terrain, and enemy forces with a zone defined by boundaries.

- (1) *Use.* A zone reconnaissance normally is directed when the enemy's location is in doubt, when it is desired to locate suitable routes or determine cross-country trafficability within a zone, or when other similar information is essential to the conduct of tactical operations.
- (2) *Boundaries.* The boundaries of a zone reconnaissance to be performed by armed helicopters should be clearly defined and recognizable during low-level flight operations. Features such as roads, rivers, and ridge lines are suitable for these boundaries.
- (3) *Size of zone.* Factors which determine the size of the zone include—
 - (a) Surface vegetation.
 - (b) Number of critical terrain features within the zone.
 - (c) Time available for the mission.
 - (d) Air-to-ground visibility.
 - (e) Anticipated enemy actions.
 - (f) Number of reconnaissance elements available.
- (4) *Division of zone into sectors.* A large zone may be divided into several sectors and a fire team assigned to each sector. A series of air sweeps in S-turn patterns or along a rectangular course are normal for reconnaissance of a large zone. A narrow zone may be reconnoitered in the same manner as a route reconnaissance. Areas that cannot be verified from the air should be checked by ground reconnaissance.
- (5) *Formations and techniques.* Formations and techniques for searching a zone vary with the size, shape, and nature of the zone, as well as time available and the factors of METT. Care must be taken to accomplish the zone reconnaissance in a rapid manner that will preclude enemy movement from an unreconnoitered area into an area previously searched and declared clear. Reliable communication and close coordination between air and ground reconnaissance elements are essential. Normal logistical and fire sup-

port coordination arrangements are applicable to this operation.

- (6) *Sample situation.* Figure 6 illustrates boundaries, search patterns, and areas of special search that are typical of a zone reconnaissance mission. The fire team is conducting a zone reconnaissance of a large zone bounded by a river, two roads, and a railroad. The fire team employs a series of overlapping S turns, giving special attention to Route 68 and the destroyed railroad bridge within its primary zone. Phaseline Red (Route 17) is a northern reconnaissance limit imposed by higher headquarters. Elements of the fire team are in a free cruise formation to allow maximum flexibility in achieving mutual support and efficient coverage of the terrain.

c. Area Reconnaissance. Area reconnaissance is the directed effort to obtain detailed military information of all routes, terrain, and enemy forces within a specific area normally defined by critical terrain features.

- (1) *Mission performance.* Armed helicopters may perform area reconnaissance as a separate mission or as part of a route or zone reconnaissance mission. Area

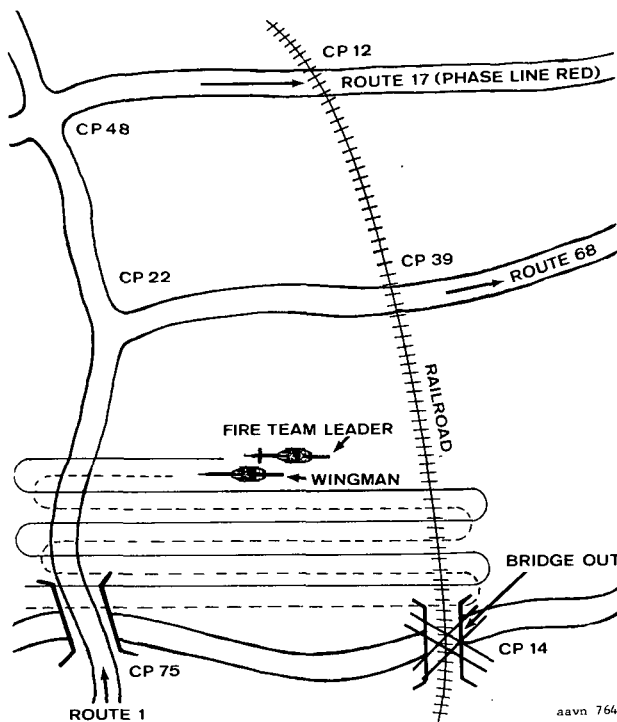


Figure 6. Fire team performing zone reconnaissance.

reconnaissance is performed using zone reconnaissance techniques. To clear an area, the armed helicopter search must be followed by ground elements clearing key or suspected areas. The armed helicopters will provide fire support for the ground patrols.

- (2) *Techniques.* Reports, checkpoints, or other control features, logistical requirements, fire support, and coordination requirements are similar to those of other reconnaissance missions. If the boundaries of the area are not clearly defined, a procedure for flying constant ground-speed, time, and heading corrected for winds will accomplish the coverage during the aerial reconnaissance.
- (3) *Sample situation.* In figure 7, the procedure for dividing the reconnaissance area

into sectors for search is shown. Several critical areas within the major search area are designated for special attention. Control and reporting points are also shown in this sketch. Reconnaissance elements can move within stated coordination points in an S pattern or any special pattern best suited to the requirements of the sector. Reference to special areas of interest will be indicated by search area designators to insure clarity (as R and G in fig. 7).

d. Special Reconnaissance. Special reconnaissance missions include such tasks and techniques as landing zone reconnaissance, reconnaissance by fire, reconnaissance for defensive operations, and reconnaissance for escort of airmobile forces. For further details concerning these special reconnaissance operations, see chapter 6 and appendix IV.

Section II. SECURITY OPERATIONS

25. General

Security includes all measures taken by a command to protect itself from espionage, observation, sabotage, annoyance, or surprise. (See FM 30-5 for guidance concerning military security.) Its purpose is to preserve secrecy and security of friendly forces in order to gain and maintain freedom of action. Security is achieved by providing for the detection of a threat; sufficient time and maneuver space to react to the threat; and the avoidance, neutralization, or destruction of the threat. Commanders at all levels must take precautions against both air and ground threats.

a. Security Against Ground Threats. Ground threats to security include enemy reconnaissance; attack by ground, airmobile, or airborne forces; infiltrators; irregular forces; or partisans. For operations against irregular forces, see FM 31-15.

- (1) Security forces must evaluate and use the terrain to enhance their security efforts.
- (2) Security is provided by air and ground reconnaissance; covering forces; advance, flank, and rear guards; and local security of individual units. It is best provided by an armed helicopter/ground security team. With inherent mobility, communications, firepower, speed, flexibility, and unique capabilities of observation and immediate attack, armed helicopters are an ideal supplement to the ground security force. Where conditions afford good air-to-ground visibility, armed helicopters may act as the primary security element.
- (3) Size and composition of security forces are dependent upon the factors of METT. Normally, a security force for a large formation must be strongly constituted and located to provide adequate time for the main body of friendly forces to react. Within their capabilities, security forces will engage the enemy in combat as necessary to accomplish the mission. Armed helicopters normally will be used as an economy-of-force measure to secure the main force and to prevent the diversion of its units to meet the threat, allowing the main force to accomplish its primary mission.

- (4) In all situations, security forces should be afforded the firepower capability for effective operations against the enemy force that poses the threat. For example, an armed helicopter unit commander who anticipates operations against the enemy armored threat will tailor his force and adjust his tactics to meet this specific threat.

b. Security Against Air Threats. Security against air threats normally is provided by high-performance aircraft and surface-to-air defense weapons. However, armed helicopters can contribute to security against enemy helicopters and other slow-flying aircraft.

26. Principles of Security

a. Timely and Accurate Warning. The provision of timely and accurate warning is paramount. The security force must provide the commander of the main body with early warning of the location and movement of enemy forces that constitute a threat to his mission. Through timely and accurate warning information, the commander of the secured force can choose the elements, time, and place to engage the enemy and gain tactical surprise.

b. Space for Maneuver. Security forces will operate far enough from the secured force to insure that this force has space and time to maneuver, to meet, or to avoid the enemy threat.

c. The Location or Movement of the Secured Force. A security force maneuvers according to the location and movement of the force it is securing. It positions itself between the friendly force and the known or suspected enemy threat.

d. Continuous Reconnaissance. All security forces must perform continuous and aggressive reconnaissance. Reconnaissance provides the security force commander with information of enemy forces in the assigned areas of responsibility, and enables him to properly position the main security force with respect to the secured force and the enemy threat.

e. Maintain Enemy Contact. Once contact with the enemy has been accomplished, it must be maintained until the enemy ceases to be a threat to the secured force or until the enemy moves out of the assigned area of responsibility. Visual contact is not broken unless ordered by higher

headquarters. If the enemy force moves out of the area of responsibility, action will be taken to inform adjacent units and assist them in establishing contact with the enemy.

27. Techniques of Engagement in Security Operations

Each armed helicopter mission commander will prescribe general or specific actions to be taken upon enemy contact, but will not restrict the initiative and flexibility of subordinates. The special situation reflected in the factors of METT will, as in all other military operations, guide the mission commander's decision. The techniques outlined below are characteristic of most security missions.

a. Deploy and Report.

- (1) Armed helicopter forces move rapidly in order to fire on, observe, or engage in limited combat with the enemy. This initial deployment is a decision normally made by the fire team leader; it must be made aggressively and executed with violence and speed.
- (2) The mission commander immediately reports enemy contact, his initial actions, and his estimate of the situation to the supported unit or to higher headquarters.

b. Develop the Situation by Offensive Action.

Action is taken to determine the strength, location, composition, and disposition of the enemy force. Care must be taken in this phase not to overextend the armed helicopter force, thereby losing the initiative and flexibility of action.

c. Course of Action. After developing the situation, the mission commander will choose a course of action appropriate to the immediate situation and the assigned mission. Speed is essential since it will provide the armed helicopter force with the advantage of surprise in engaging the enemy.

d. Report. The mission commander's report includes the complete enemy situation as it was developed, actions that are being taken, and a request for additional support if necessary.

28. Types of Security Missions

An armed helicopter unit may act as a screening force or in support of an advance guard, flank guard, rear guard, a covering force, or a rear area security force, and positions itself to best accomplish the task (fig. 8). Armed helicopters will

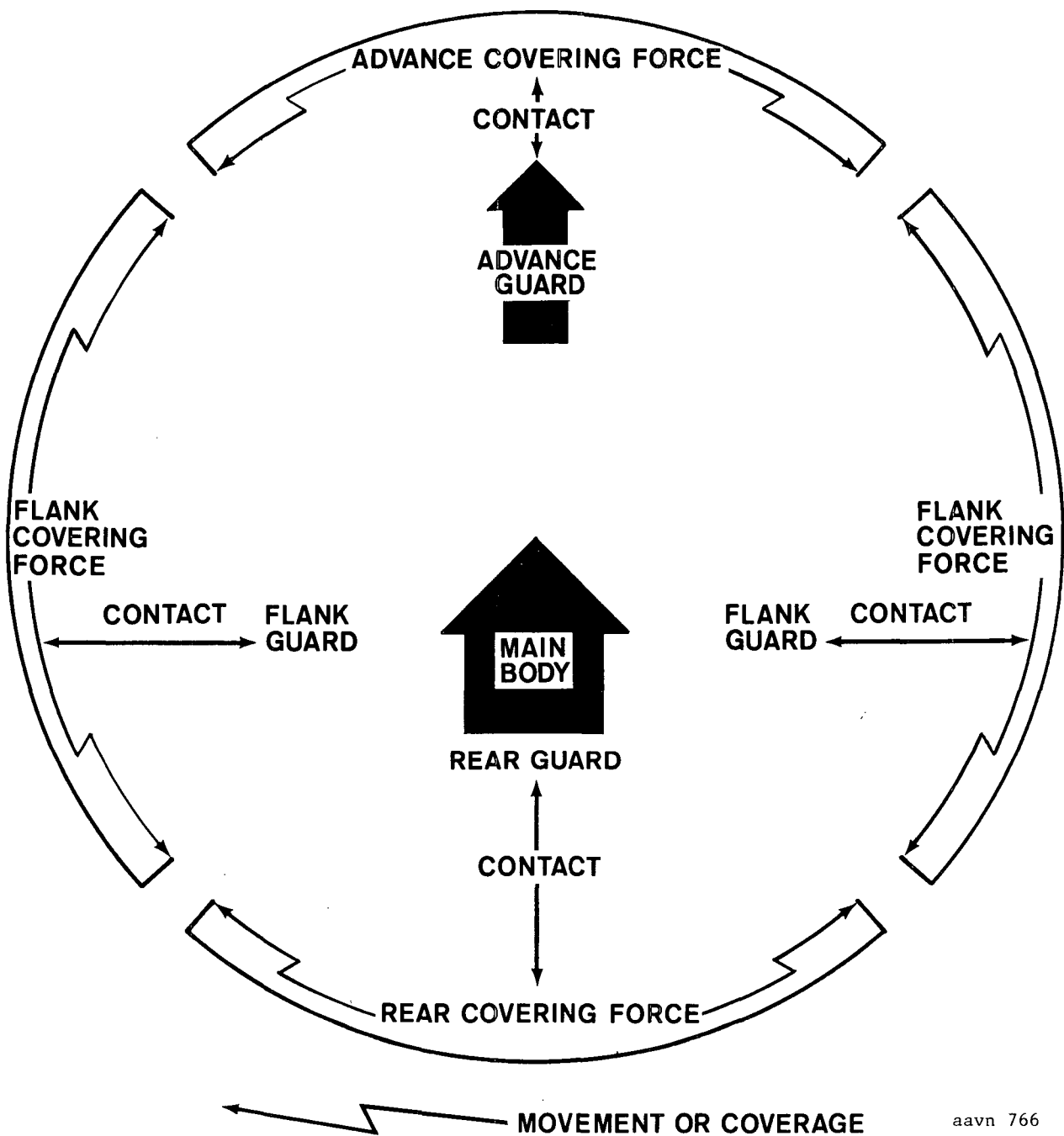
augment conventional ground security forces except when employed as a temporary independent economy-of-force measure. They will engage in offensive, defensive, or delaying actions, as required to accomplish the mission.

a. Screening Force.

- (1) *Operation.* A screening force maintains surveillance over an extended frontage to the front, flanks, or rear of a moving or stationary force. It provides early warning by observing, reporting, and maintaining visual contact with enemy forces encountered. It does not have the capability of nor should it become decisively engaged with the enemy.
- (2) *Factors and considerations.*
 - (a) Armed helicopters may be employed in a semi-independent screening role as an economy-of-force measure.
 - (b) Ground observation posts are used to augment screening capabilities during night operations, in heavily vegetated terrain, and during periods of limited visibility. These observation posts must be established and supported by the armed helicopter force.
 - (c) Detailed service support planning must precede all screening missions.
 - (d) Navigational assistance may be required during adverse weather conditions and extended night operations.

b. Advance Guard.

- (1) *Operation.* An advance guard is a security force, primarily offensive in nature, that operates to the front of a moving main force to insure its uninterrupted advance and to protect it from surprise attack by defeating, destroying, or delaying the enemy. When small enemy units are discovered, the advance guard normally will destroy them before they can hinder the advance of the main body. When the advance guard encounters large enemy forces or heavily defended areas, it takes prompt and aggressive action to develop the situation, and employs every means available to determine the location, strength, disposition, and composition of the enemy. It may then be required to join in the attack conducted by the main body.



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Figure 8. Relative locations of security forces with respect to main body of troops.

(2) *Factors and considerations.* Armed helicopters disrupt and harass enemy operations by using their mobile firepower in support of the advance guard. They render intelligence spot reports to assist the ground commanders in their estimate of the situation. Armed helicopters

maintain a distance far enough ahead of the main body to insure early detection of enemy forces and to allow adequate time and space for maneuver. However, care must be taken that the armed helicopters do not operate so far in front of the main force that they become cut off

or ineffective. This distance will be governed by such factors as air-to-ground visibility, enemy capabilities, and support capabilities. Factors and considerations for the employment of armed helicopters are—

- (a) Fuel and ammunition must be planned to facilitate helicopter turnaround.
- (b) Helicopter may operate beyond the range of supporting weapons.
- (c) Armament and ammunition should be tailored to meet anticipated threats.
- (d) Contingency plans to protect or rescue downed crews and to support aircraft recovery operations must be prepared in detail.
- (e) Recognition signals and communications procedures for air-to-ground operations must be thoroughly understood by all flight crews.
- (f) The use of additional fuel cells to extend helicopter radius of action if such will not reduce the armament and ammunition required to accomplish the mission.
- (g) Initial actions upon enemy contact must be thoroughly understood by all flight crews.
- (h) A procedure for helicopter and crew replacement must be preplanned to facilitate continuous operations throughout the advance of the main body.

c. Flank Guard.

- (1) *Operation.* A flank guard (fig. 8) is a security force that operates to the flank of a moving or stationary main body to protect it from enemy ground observation, direct fire, and surprise attack. This force must be strong enough to defeat minor enemy forces or to delay strong enemy attack until the main body can deploy. It may employ offensive, defensive, or delaying actions as necessary to accomplish the mission.
- (2) *Factors and considerations.*
 - (a) To determine likely avenues of enemy approach, a detailed map reconnaissance will be conducted prior to the departure of the armed helicopter force. Armed helicopters will reconnoiter

these likely avenues in support of the flank guard.

- (b) The blocking positions of the ground force and general disposition of the flank guard must be known to all helicopter elements.
- (c) Armed helicopters will extend the ground reconnaissance and assist in maintaining contact with the enemy by patrolling gaps between the major blocking positions.
- (d) Armed helicopters extend the security of the flank guard force by conducting zone reconnaissance along the route of advance of the flank guard.
- (e) Armed helicopters may be employed to maintain contact between the main body and the flank guard.

d. Rear Guard.

- (1) *Operation.* A rear guard is a security force that operates to the rear of an advancing or withdrawing main body to protect it from enemy surprise attack or annoyance. This force must be strong enough to defeat minor enemy forces or to delay strong enemy attack until the main body can deploy.
- (2) *Factors and considerations.*
 - (a) The general factors and considerations listed under advance and flank guard missions pertain to this operation.
 - (b) Armed helicopters extend the ground force reconnaissance, surveillance, and combat capabilities. They provide early warning of enemy approach. Distances are sufficient to insure adequate reaction time and allow maneuver space for the main body.

e. Covering Force.

- (1) *Operation.* A covering force is a highly mobile, tactically self-contained security force that operates at a considerable distance to the front, flank, or rear of a moving or stationary force. The mission of the covering force is to contact the enemy early and, if possible, destroy or suppress him; otherwise the mission is to deceive, delay and disorganize enemy forces until the main body can prepare for action. Armed helicopter units normally will perform a screening mission (a above)

when they are operating as a part of a covering force.

(2) *Factors and considerations.*

- (a) The armed helicopter unit normally will establish an air screen beyond the ground covering force position to provide early warning of enemy approach. If the armed helicopter unit is forced to withdraw, it should delay the enemy within its capability and protect the flanks of the covering force, avoiding decisive engagement with the enemy.
- (b) In covering force operations, every effort will be made to deceive the enemy as to the location of the blocking positions of the covering force.
- (c) As a part of a covering force in an advance-to-contact, armed helicopters normally will reconnoiter to the front and flanks, employing zone reconnaissance techniques. The unit will be employed in the formation best suited to provide thorough reconnaissance of the area through which the friendly forces are advancing. Small enemy forces encountered by the armed helicopters are destroyed or routed by fire.

f. *Rear Area Security Force.*

- (1) *Operation.* A rear area security force protects rear area units (e.g., rear guard) (fig. 8), installations and lines of communication from enemy surprise attack. Armed helicopter rear area security missions will include—
 - (a) Supplementing local security fires.
 - (b) Patrolling routes and lines of communication.
 - (c) Convoy escort.
 - (d) Surveillance of possible bases of operations for irregular forces or infiltrators.
 - (e) Denial of potential drop and landing zones.
 - (f) Finding, fixing, and destroying enemy forces in rear areas.

(2) *Factors and considerations.*

- (a) The armed helicopter unit commander must coordinate with supported ground units in the rear area to insure mutual understanding of the overall security effort.
- (b) Areas of possible enemy activity, such as landing or drop zones, must be studied. Plans must be prepared and rehearsed to destroy enemy forces if these areas are used.
- (c) To avoid disclosing a regular pattern of flight to the enemy, armed helicopter patrols will be preplanned to patrol lines of communications and key installations using various irregular flight patterns and time intervals. These patrols may consist of single fire teams, with the main helicopter force at a central location for ready commitment. This ready-alert helicopter force should have crews standing by to commit the helicopter ready force, receive implementing instructions by radio en route to the target area, join the elements on station, and complete the mission.
- (d) Greater offensive actions will be undertaken by armed helicopters since enemy elements in rear areas normally will be lightly protected. Initial ammunition loads will be tailored for antipersonnel targets; however, ammunition loads tailored for antiarmor operations should be prepared and positioned in the ground alert area.
- (e) Armed helicopter alert areas must be secured by a ground security force.
- (f) Should the rear area be too large for adequate coverage from a single ground location, the armed helicopter unit commander will divide his force and designate areas of responsibility to separate elements. However, he must be able to mass his unit rapidly.

CHAPTER 5

SUPPORT OF OFFENSIVE OPERATIONS

Section I. ARMED HELICOPTER ATTACK

29. General

Armed helicopter attacks augment the ground commander's capability to deliver selective, responsive, accurate, and discriminating fires on the ground objective. The primary mission of the armed helicopter attack is to destroy or suppress the enemy through the concentrated delivery of aerial firepower against enemy machinegun emplacements, bunkers, tanks, personnel, and other targets that, when neutralized, will assist the ground commander in seizing his attack objective. Two missions in the attack are *suppression* and *destruction*.

a. Suppression. A suppression mission does not place emphasis upon inflicting high casualty rates or materiel losses on the enemy, but rather on rendering enemy combat power ineffective for a given period of time. Enemy use of weapons and countermeasures must be neutralized by suppressive fires. The movement of enemy forces to reposition combat power and thereby influence the action is minimized. Attacking helicopter elements prevent effective enemy fire and restrict enemy movement for the duration of the suppression mission. Prior to conducting the suppression fire mission, a decision by the commander is made as to the type of weapons, amount of ammunition, warhead selection, method of attack, and engagement and disengagement ranges, tailoring each element to the mission.

b. Destruction. A destruction mission requires that a high casualty rate be inflicted upon enemy personnel and equipment. Normally a destruction mission for armed helicopters will be related to a small area or to point targets. A destruction mission may be assigned in addition to or in conjunction with a suppression mission; for example, point targets within an area to be suppressed may be designated for destruction. The implied task of reconnaissance or poststrike analysis is under-

stood in a destruction mission unless instructed otherwise. This poststrike analysis is ideally accomplished by the armed helicopter mission commander during the termination phase of the attack. If the target remains active, subsequent attacks will be initiated using all available resources to accomplish the mission. Planning considerations for destruction missions are essentially the same as those for suppression missions; however, the weights applied to various factors will change.

30. Fundamentals of Armed Helicopter Attacks

To accomplish the attack mission of suppression or destruction, the following fundamentals must be considered:

a. Surprise. Surprise, based on sound tactical planning, is essential.

b. Speed. Attacks are conducted with maximum speed, determined effort, and concentrated violence.

c. Volume of Fire. Maximum volume of fire is maintained throughout the engagement of the attacking elements.

d. Timing. Precise timing of the attack and the disengagement is necessary to exploit mutual support of all attacking elements and to reduce the effect of enemy countermeasures.

e. Flexibility. The armed helicopter mission commander must be allowed the widest latitude of initiative in accordance with the principles of war. He must use all factors to his advantage, move decisively, and defeat the enemy.

f. Avoid Enemy Strength. To place the enemy at his greatest disadvantage, enemy areas of strength are avoided while his areas of weakness are exploited.

g. Combat Power. Available combat power is used to the maximum.

1. Target Analysis

a. General. Target analysis is an examination of the target environment and physical characteristics related to the factors of METT (para 6). Whether the target is acquired from a photo study, aerial reconnaissance, or during the conduct of an operational mission, the considerations given it are the same; only the available planning time varies. Due to the low levels and the high speeds at which armed helicopters normally conduct missions, the armed helicopter mission commander must be able to correctly analyze a target, formulate his plan, and issue his orders in a matter of seconds.

b. Factors. Factors to be considered in the analysis of all targets include—

(1) *Mission.* Destruction, suppression.

(2) *Target characteristics.*

(a) *Type target.*

1. *Personnel.* Number, activity, and disposition, prepared or hasty positions, moving or stationary.

2. *Material.* Protected or unprotected, combustible, structural resistance.

3. *Vehicles.* Number and type, armored or unarmored, moving or stationary, disposition, accompanied by infantry.

4. *Weapons.* Type, capabilities, means of target acquisition, fields of fire.

(b) *Defense.* Protected by antiaircraft weapons, enemy air superiority over the target area.

(c) *Location.* Relation to friendly positions, avenues of approach and disengagement, engagement and disengagement ranges, initial attack pattern and altitude.

c. Selection of Weapons. Based on the factors in *b* above, the mission commander will select the type of weapon or a combination of weapons to be employed on the target. Generally, machine-guns will be employed against troops who are in the open or lightly protected; rockets against troops who are protected in wooded areas or lightly armored vehicles; missiles against tanks, armored vehicles, or other hard targets; or any combination of the above weapons, according to the nature of the target.

32. Methods of Attack

The method of attack will be selected by the mission commander based upon the factors of METT.

Armed helicopters may attack a target by *running fire*, *hovering fire*, or *stationary fire*.

a. Running Fire. Running fire is delivered on a target while the helicopter is in forward flight. It can be delivered from any altitude, provided the slant range to the target is compatible with the maximum effective range of the weapon. Running fire employed through delivery from the nap-of-the-earth flight mode takes maximum advantage of available cover and concealment. This mode provides fire which is highly effective against troops in the open, but the armed helicopter's vulnerability is increased if the troops are located in terrain offering cover. Higher flight altitudes during attack will result in diving fire at short slant ranges, which also increases vulnerability of the attacking armed helicopter. A dive angle of approximately 15° will give optimum point fire accuracy and maximum destruction of an enemy in foxholes or trenches, due to the resulting plunging fire. Steeper dive angles will result in higher airspeeds that require initiating the disengagement at greater ranges to avoid target overflight. Targets may be engaged from the rear, from the flanks, or frontally. If more than one task is required, succeeding passes should be made from different directions to preclude enemy anticipation of succeeding firing runs.

b. Hovering Fire. Hovering fire is delivered with the armed helicopter in a covered or concealed position. Available cover and concealment must be used during the approach and execution of the fire mission. Where terrain permits, the helicopter should be moved laterally between bursts of fire so that it does not appear to the enemy twice from the same position. Background for the helicopter should be chosen with care to avoid being silhouetted against the sky or light terrain. Fire teams will alternate their attacks in order to place continuous fire on the enemy position. The helicopter is extremely vulnerable when practically motionless over the ground. Firing from a hover does not significantly increase weapons accuracy. With certain weapons systems (e.g., the aerial rocket), a loss of accuracy causes fire from a hover to be impractical. Hovering fire should be used only when it is necessary to clear a terrain mask, or to attack lightly defended areas for short durations. Loss of observation, mobility, flexibility, and maneuver must be thoroughly considered by all commanders prior to the employment of armed helicopters in a hovering attack.

c. Stationary Fire. Stationary fire is delivered with the armed helicopter in a static ground position. For some systems, this method provides excellent accuracy due to the elimination of normal dispersion errors caused by helicopter movement. However, stationary fire momentarily loses mobility and thus increases the vulnerability of the armed helicopter. Cover, concealment, and well-planned exit routes are mandatory. The loss of mobility observation, flexibility, and surprise must be carefully weighed by the commander when considering employment of stationary fire.

33. Techniques of Engagement

Each armed helicopter unit commander will evolve techniques that suit his unit's mission and special situation. The technique to use for a specific operation will be based on the mission commander's estimate and analysis of the situation. Some of the engagement techniques that have been employed with success are listed below. Most of these techniques are interrelated, but the use of one technique may result in the omission of another.

- a.* Attacks are conducted at optimum airspeed.
- b.* Attacks are made from minimum effective altitudes.
- c.* Firing begins at maximum system effective range.
- d.* Targets are kept under continuous fire throughout the attack.
- e.* All effective fires from each helicopter will continue during its disengagement.
- f.* A minimum of two helicopters are used in the attack.
- g.* Formations are selected that offer maximum mutual support.
- h.* Firing runs will use more than one ground track.
- i.* Attacking helicopters will not overfly known enemy positions.
- j.* Each armed helicopter will observe other aircraft attacks and shift fires to obtain maximum target coverage.
- k.* Attack patterns will be oriented so that the firing run corresponds to the long axis of the target.
- l.* Ammunition expenditure will be restricted to that necessary to accomplish the mission without overkilling the target.
- m.* Ejection of ammunition casings over heads of friendly troops will be avoided.
- n.* The wingman will cover the leader's disen-

gement by fire and will disengage at a greater target range than the leader.

o. Paralleling terrain features such as roads and ridgelines will be avoided.

p. Aircraft with flexible weapons systems normally will use right hand turns during disengagement (for aircraft with side-by-side seating).

q. A troop safety buffer zone should be established.

34. Attack Patterns

Normally, specific attack patterns cannot be pre-planned; however, certain considerations apply to all patterns. The mission commander will adjust each attack to take advantage of the terrain and weather, exploit enemy weaknesses, and employ his combat elements to gain the maximum advantage. Important considerations in the selection of an attack pattern include: the number of attacking elements, the target characteristics, weapons capabilities, friendly forces in the immediate area, the disposition of enemy defenses, and the requirement for a change in direction of subsequent attack passes. Two of the more successful attack patterns are the cloverleaf and the I.

a. Cloverleaf Pattern. The cloverleaf (fig. 9) may be employed during destruction missions against point or small area targets.

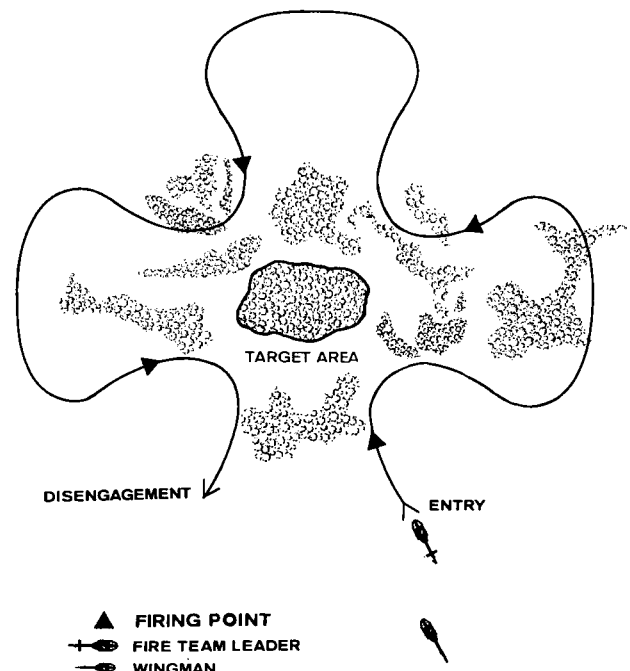


Figure 9. Cloverleaf attack pattern.

(1) *Advantages.*

- (a) Direction of each attack pass changes, thereby preventing enemy concentration of fires in anticipation of subsequent attacks.
- (b) Good target coverage is obtained from several directions, requiring enemy defenses to be constructed for all-around protection.
- (c) Continuous fire can be placed on the target, precluding enemy movement to reposition forces.
- (d) Engagement range, disengagement range, and timing of attack are flexible.
- (e) Attacking helicopters are mutually supporting, and the mission commander can maintain control of the attack.
- (f) The pattern may be modified to adapt to the terrain and the number of firing passes required.
- (g) Initial entry and the attack pass can be established at any point.

(2) *Disadvantages.*

- (a) The number of attacking helicopters is limited.
- (b) Hostile areas may be overflown.
- (c) Care must be exercised not to fire into adjacent friendly positions.

b. *1 Pattern.* The 1 (fig. 10) may be employed during suppression missions when large volumes of fire of short duration are desired against linear targets, or targets which are masked on one side by high terrain. 1 patterns normally are used only for the initial attack. Upon disengagement, fragmentary orders are issued for subsequent attacks including attack patterns, based on an analysis of the initial attack and the mission.

(1) *Advantages.*

- (a) The enemy is fixed during the period of maximum fire delivery.
- (b) Surprise and speed of attack expose the armed helicopter for minimum time periods. Good target coverage is obtained from two directions simultaneously.
- (c) The beaten zone of at least one attacking element will correspond to the long axis of the targets.
- (d) The enemy is forced to defend in two directions simultaneously.
- (e) Maximum engagement and minimum

disengagement ranges are allowed by this pattern.

(2) *Disadvantages.*

- (a) Control, timing, and formations are critical.
- (b) If disengagements are not properly phased, little or no fire is placed on target between firing runs.

35. Attack Formations

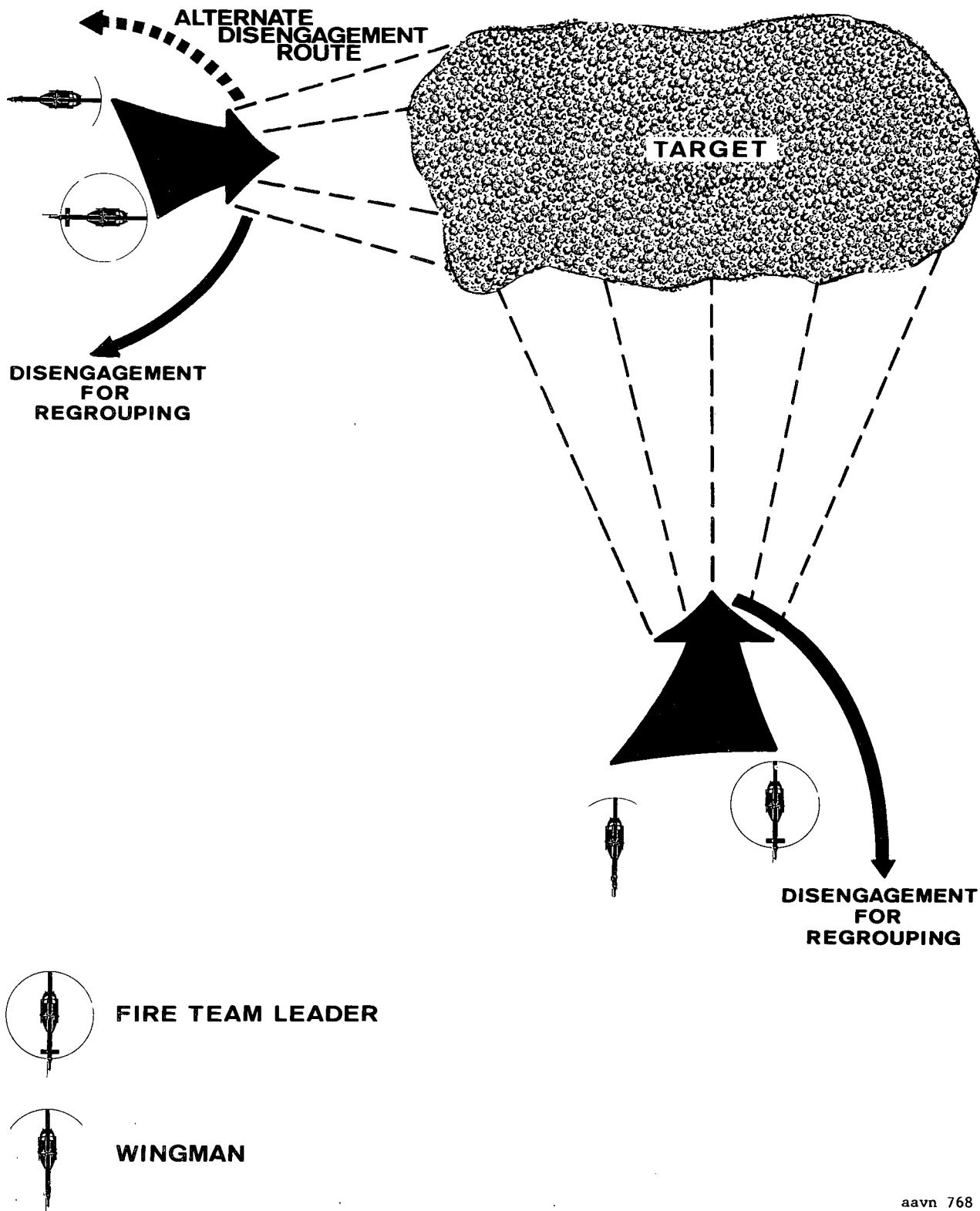
Attack formations must be tailored to the specific requirement of the target. Unit SOP's should contain guides for attack formations. Factors to be considered when developing standard attack formations are—

a. *Control.* All attack formations should lend themselves to positive control. The elements of the formation must be responsive to the leader's orders.

b. *Flexibility.* The formation must be capable of rapidly shifting to meet any new threat or exploit any enemy weakness.

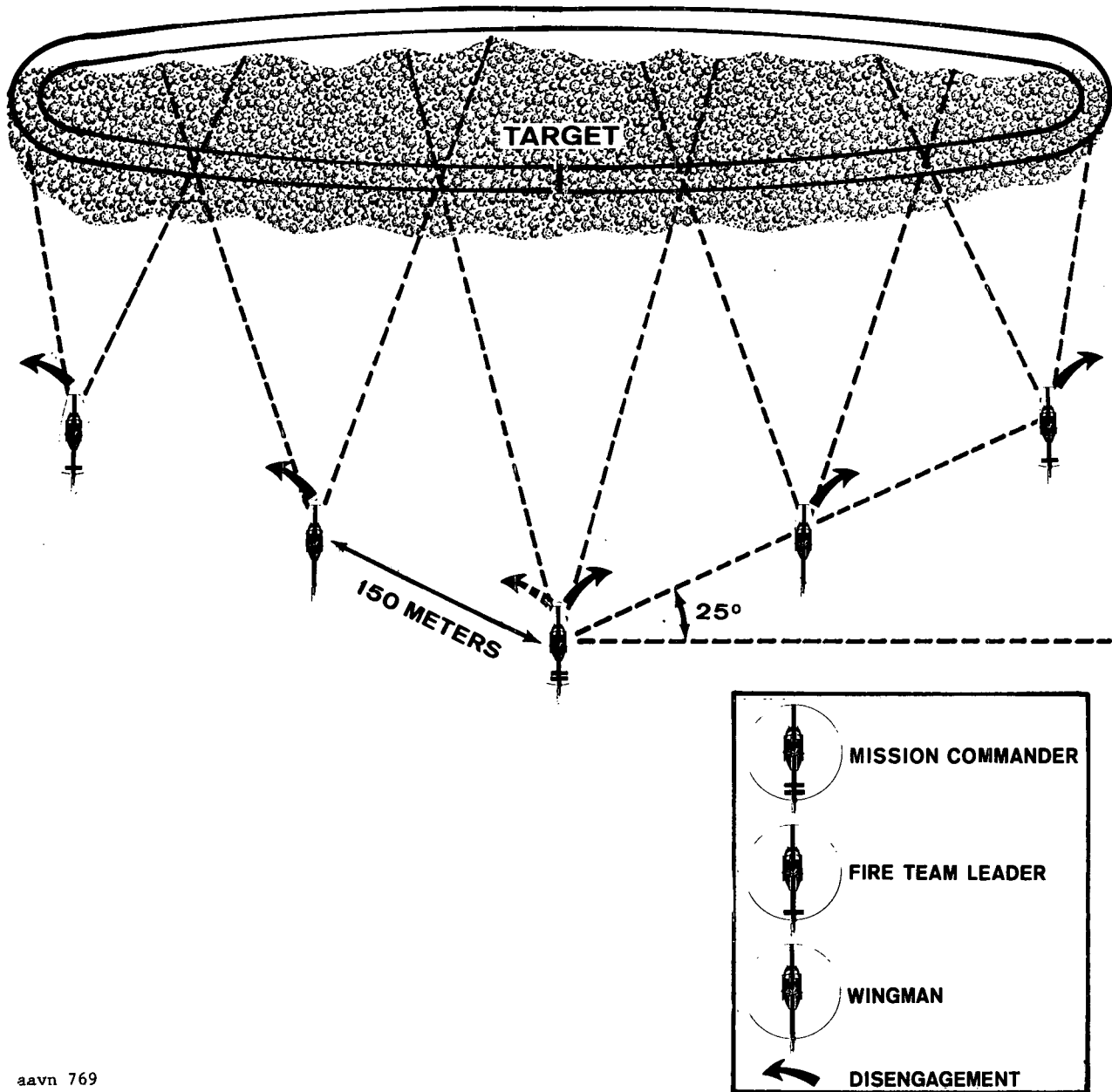
c. *Firepower.* The requirement to deliver maximum fire in any direction should result in a formation tailored for that purpose. For example, a suitable formation for the delivery of maximum fire to the front is the extended inverted V (fig. 11). In this formation, maximum fires are delivered to the front from all helicopters simultaneously. Elements may disengage at any time without masking the fires of another element. Position in the formation is maintained with the aviator's peripheral vision rather than direct vision. The mission commander can observe and adjust positions and fire distribution at all times. The formation may be shifted readily to meet any threat.

d. *Mutual Support.* All armed helicopters should be within weapons support range of each other during the attack. Flexible weapons systems will allow more latitude for aircraft maneuver than fixed systems. Mutual support must be continuous within attacking fire teams and should be maintained between attacking fire teams and platoons whenever possible. During disengagement, fire teams break away from each other. The mission commander may break with either fire team and issues fragmentary orders for regrouping. Normally the mission commander will increase his rate of fire as the fire teams initiate the disengagement.



aavn 768

Figure 10. L attack pattern.



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Figure 11. Extended inverted V attack formation.

e. Exposure. Flying over the same ground track by successive elements should be avoided. Adequate separation must be maintained between the elements of the formation; they key considerations for adequate separation are the armed hel-

icopters' weapons characteristics and the target acquisition capabilities of the enemy as opposed to terrain and weather advantages available to the armed helicopter force.

Section II. TYPES OF OFFENSIVE OPERATIONS

36. General

Offensive operations are characterized by aggressiveness, speed, shock, surprise, and violence. Armed helicopters are capable of providing responsive support to all types of ground offensive operations, as well as conducting independent attacks. However, a major consideration when employing armed helicopters in support of the offensive operation is their vulnerability to fires from well-organized or heavily fortified enemy positions.

37. Attacks Against Lines of Communications and Supply

a. General. Armed helicopters may conduct preplanned attack missions against lines of communications and supply in the forward portion of the enemy's combat zone. Typical targets are supply routes leading into the forward battle area, communications centers, and forward supply depots. Attacks may also be conducted against targets of opportunity such as moving vehicles and watercraft.

b. Planning the Mission.

- (1) The mission must be planned to avoid known enemy troop concentrations, anti-aircraft positions, and artillery.
- (2) The mission commander must coordinate with friendly artillery to insure that his flight route does not interfere with preplanned artillery fire. If available, the artillery may fire smoke on critical points along the flight route to cover the armed helicopter passage of those areas. In addition, high explosive concentrations may be placed on enemy positions along the proposed flight route.

c. Conduct of the Attack. The attacking armed helicopters must execute their mission rapidly and violently and then withdraw. This technique engages the enemy by surprise before he can organize his forces and bring his combat power to bear on the attacking helicopters.

38. Raids

a. General. Armed helicopters performing a raid normally will have the mission of destroying or neutralizing a target by surprise attack, followed by rapid withdrawal from the target area. Normally, raid operations will be shallow in depth and may be compared to tank sweeps

against selected targets. Armed helicopters may conduct raids when enemy defenses limit the point fire capabilities of friendly high performance aircraft, or when the raid target is out of range of friendly artillery. The helicopter raid force should accomplish its mission in a maximum of two runs on the target, preferably one on the way in and one on the way out, using an attack pattern that will result in maximum destruction in the minimum time period. The raid force should use a route of withdrawal which is different from the approach route to the target.

b. Planning the Raid. The mission commander should assign individual targets to fire teams. Armed helicopter raid targets will be small, requiring point fire accuracy. Time permitting, rehearsals should be run on similar terrain. Surprise is absolutely essential to the success of a raid. In order to achieve surprise at the moment of attack, the armed helicopter force must plan to—

- (1) Avoid en route enemy positions.
- (2) Employ frequent changes in direction of flight.
- (3) Make maximum use of terrain and weather conditions.
- (4) Request other armed helicopters to perform feints elsewhere in the battle area.
- (5) Coordinate with the Air Force and artillery to suppress the enemy's observation capability and render on-call support.

c. Support of Airmobile Raid Forces. Armed helicopters may support an airmobile raid. Close coordination must be effected between the ground commander of the airmobile force and the supporting armed helicopter mission commander, to include coordination of smoke or cluster signals for lifting and shifting of helicopter fire. If the raid force is to be helicopter-lifted out of the area after the raid has been accomplished, the mission commander must insure that sufficient ammunition is held in reserve to protect the extraction of the force. Consideration should be given to coordination for artillery and Air Force suppression of enemy ground-to-air fire during the attack and the withdrawal from the area.

39. Support of Ground Offensive Operations

a. General. Armed helicopters support the ground offensive by providing aerial firepower

that will significantly increase the overall effectiveness of the ground attack mission.

b. Penetration. Armed helicopters may support a penetration by attacking the enemy forces that are maneuvering into positions to counter-attack the penetrating force. Detailed coordination with ground commanders must be made to insure that the helicopter force does not misidentify friendly troops as enemy forces. This is most critical during conduct of the breakthrough, when the line of contact is not easily distinguished and friendly forces are in close contact with the enemy.

c. Exploitation. Armed helicopters are well suited to the support of an exploitation. The mobility and firepower of armed helicopters will increase the speed of the ground forces exploitation. The armed helicopter can be employed to extend reconnaissance and security for the main force during the exploitation. If the exploitation involves the envelopment of an enemy flank, the armed helicopter force may attack enemy troops attempting to escape the envelopment, and disrupt and disorganize enemy attempts to reinforce threatened units. The armed helicopter force may extend flank reconnaissance and security, permitting the ground force commander to pursue the exploitation with greater speed and boldness of action. The armed helicopter mission commander must make arrangements for refueling and rearming during the conduct of the exploitation. In a fast moving exploitation (armored, mechanized infantry) this is a critical problem. Transport helicopters may be used to deliver ammunition and fuel forward on call, at a time and place selected by the armed helicopter mission commander in coordination with the ground force commander. Servicing areas and delivery times must be coordinated with both the ground commander and the transport helicopter unit commander performing the resupply mission.

d. Counterattack. Armed helicopters supporting a counterattack provide the ground commander with aerial firepower that may be rapidly deployed against the flanks of the enemy offensive and against forces maneuvering to reinforce the main enemy attack. The armed helicopter mission commander must assist in the coordination of the tactical ground plan and the helicopter fire support plan, and insure that his fire teams know the locations of the friendly ground forces. When this information is known in advance, he

will assign targets to fire teams. During conduct of the mission, the armed helicopter mission commander will issue appropriate fragmentary orders as targets of opportunity are sighted. After coordination with the ground commander, the armed helicopter mission commander will select rendezvous locations and known safe areas for emergency landings. These must be disseminated to the fire teams.

40. Airborne Operations

a. General. Armed helicopters may support the conduct of airborne operations. During the assault and organization phases, the armed helicopters will provide suppressive and antitank fire to secure the airhead from ground attack. After the airhead has been established, the helicopter will be assigned the mission of extending reconnaissance and security for the ground force. For further details on airborne operations, see FM 7-11, 7-20, 57-10, and 57-35.

b. Planning Considerations. A primary consideration is the deployment of the armed helicopters to the airhead area during the air movement phase.

- (1) If the airborne operation is to be conducted within the fuel range of the armed helicopters (including the use of a ferry tank), the armed helicopter mission commander should consider flying his helicopters to the airhead in order to provide immediately available fire support to the parachute assault echelon. The mission commander should plan the arrival of his armed helicopter force in the airhead area to coincide with the beginning of the parachute assault. The mission commander should also plan the arrival of his armed helicopter force immediately subsequent to the termination of the preparatory fires in order to use these fires to cover his approach. The armed helicopter force will initially provide suppressive fire in the drop zone area and neutralization of key targets (enemy anti-aircraft installations, communications sites, command post, reserve positions, etc.). Initial ammunition loads should be selected to fit these targets. Coordinated preplanning will insure that armed helicopter activity does not constitute a hazard to personnel parachuting into the

drop zone or adversely restrict other supporting fires. Armed helicopters will continue to act in economy of force roles to protect airborne forces during assembly and movement to initial airhead objectives. Support will shift to reconnaissance and security operations after seizure of the airhead line. Since anti-tank missions and neutralization of enemy forces moving toward the airhead may be anticipated to be predominant at this time, armament and ammunition loads should be selected for these type targets.

- (2) If the airhead is beyond the fuel range of the armed helicopters and the helicopters are to be flown to the airhead, provisions must be made for refueling en route. If the refueling must be accomplished in a hostile area, the fuel can be—
 - (a) Dropped by parachute or airlanded immediately prior to the arrival of the armed helicopters, or
 - (b) Seized from the enemy by partisans, or
 - (c) Transported in other aircraft which will accompany the armed helicopter formation.

Security must be considered carefully prior to planning to refuel in a hostile area.

- (3) If the airborne assault is to be conducted beyond the maximum fuel range of the armed helicopters and they are to be airlifted, the helicopters should be airlanded as soon as practicable after the initial assault. To reduce the time required to place armed helicopters in an operational status, USAF cargo aircraft that afford minimum disassembly of the armed helicopters are ideal. Maintenance personnel and aircrews will accompany the helicopters in the cargo aircraft to expedite placing them in a flyable status as soon as possible after unloading. The initial ammunition load should accompany each helicopter in its cargo aircraft.
- (4) Resupply of fuel and ammunition should be airlanded with the followup echelon. Designated POL and armament personnel should accompany these supplies to expedite distribution. If resupply is to be parachuted into the drop zone, fuel

and ammunition for the armed helicopters should be heavy dropped with the airborne force heavy drop load. Designated POL and armament personnel should jump with the supplies and assemble them at a central point. These personnel must also position their ammunition and POL loads and lay out landing panels for helicopter servicing operations. Resupply and refueling will be conducted as discussed in paragraph 19 above.

- (5) The timing of servicing operations must be phased in order to maintain continuous aerial fire support, reconnaissance, and security. Initial servicing should be accomplished alternately by fire teams, thereby providing steady fire support during the critical landing phase. Additional servicing should be accomplished subsequent to the seizure of initial assault objectives.

41. Airmobile Operations

Armed helicopter support of airmobile operations is discussed in paragraph 47.

42. Amphibious Operations

a. General. Armed helicopter support of amphibious operations normally involves the escort and fire support of the airmobile forces landing in conjunction with the beach assault. Actions in the objective area and over land areas are essentially as discussed in airmobile operations (para 47). For further details concerning amphibious operations, see FM 31-12 and 31-13.

b. Special Considerations. Special considerations encountered in the support of amphibious operations which result from employing aircraft carriers in lieu of land based staging areas are—

- (1) Aircrews must be trained to operate from aircraft carriers, to include proficiency in over-water navigation, the use of aircraft carrier navigational aids, and water survival to include ditching procedures. The essential techniques and procedures used during aircraft carrier launch and recovery operations must be practiced by all crews.
- (2) During the planning phase, the mission commander must consider naval gunfire plans as they affect flight routes and he

must know the radio frequencies of ANGLICO, Naval Air, and the amphibious force.

- (3) During the execution phase, emphasis must be placed on fire support when assault troops commence the seizure of the

initial beachhead line. Normally, conventional supporting fires are shifted to deeper targets. Armed helicopters may be used in this period to satisfy the ground commander's immediate fire support requirements.

CHAPTER 6

DEFENSIVE AND RETROGRADE OPERATIONS

43. General

Armed helicopters may support infantry, armored, and mechanized ground forces engaged in defensive operations. As in offensive operations, the primary mission of the armed helicopter is to destroy or suppress the enemy through the concentrated delivery of aerial firepower. Without augmentation, the armed helicopter force has a limited capability to perform defensive missions. Preparation for defensive operations requires the same detailed planning, coordination, and organization that is characteristic of offensive action. All commanders must make alternate plans that provide for all foreseeable contingencies. In defensive missions such as delaying actions or retrograde movement, the armed helicopter is used for tasks requiring reconnaissance by fire, general reconnaissance, escort operations, and aerial fire support to cover the withdrawal or disengagement of forces.

44. Basic Defensive Considerations

In planning the support of the ground defense, the armed helicopter mission commander must consider the following actions:

a. Coordination With the Ground Force Commander. Coordination is effected with the ground force commander for assigned missions, priority of fire, and for the most suitable location within the defensive area of the supported unit. Siting of armed helicopters is based on consideration of quick reaction time, communications capability, and the security of support installations. Since armed helicopter supporting fires are normally incorporated into the overall defense plan, the ground force commander must be notified when they cannot be provided or are terminated so that he may adjust for their absence.

b. Selection of Type Armament and Ammunition. The most probable target; i.e., infantry, armored, or mechanized forces, must be determined. Based on this, the most effective armaments systems and type ammunition are selected.

45. Mobile Defense

The mobile defense is that form of defense wherein minimum combat power is committed in the forward defense area to warn of the impending attack, to canalize the enemy into less favorable terrain, and to otherwise impede, harass, and disorganize him. The bulk of the combat power of the command is retained in a highly mobile reserve which engages the enemy in decisive action at a time and place of the defender's choosing. Mobile defense elements consist of *security forces* (security echelon), *fixing forces* (forward defense echelon), and a strong *striking force* (reserve echelon).

a. Security Forces. Armed helicopters may be used to support security forces by providing—

- (1) Destructive and suppressive fire support on targets of opportunity.
- (2) Aerial reconnaissance and surveillance of enemy movement forward of the line of security positions and in the gap between security force strongpoints.
- (3) Aerial adjustment of long-range artillery fires.
- (4) Airlift of supplies and emergency medical evacuation.
- (5) Escort.

b. Fixing Force. In addition to the support missions in *a* above, armed helicopters will provide fire support to canalize the enemy into areas suitable for counterattack.

c. Striking Force. While conducting a mobile defense, the bulk of armed helicopter support will normally be assigned to the striking force. The striking force is a large mobile body of troops which is withheld from action during the initial phases of an engagement, but is available for decisive employment. Close coordination is mandatory between the armed helicopter force and the ground striking force, particularly in the identification of moving friendly forces. Prior to initiating a fire support mission, the disposition and location of friendly forces must be positively de-

terminated. Armed helicopters will capitalize on speed and emphasize violence in the counterattack of enemy forces.

46. Area Defense

The area defense is designed to retain control over specific terrain for a period of time, with reliance placed on deployed forces to stop and repulse the attacking enemy. Area defense elements consist of security and forward defensive echelons, and a reserve echelon. The functions of the reserve echelon are to block enemy penetrations; counterattack to restore the battle area; execute spoiling attacks; cover gaps; patrol; perform rear area security missions; reinforce the fires of the forward defense echelon; or replace forward units. Armed helicopter elements may be assigned the mission of providing fire support to the security and forward defensive forces, escort of airmobile reserve forces, and flank and rear area security.

47. Escort of Airmobile Forces

Armed helicopters provide security to transport helicopters engaged in airmobile operations when the threat of hostile slow flying aircraft attack is present, when air-to-ground suppressive fires are required, or when a combination of air and ground protection is essential to the security of the airmobile operation.

a. Planning Considerations. Detailed planning and coordination are essential. When urgency of operations precludes normal planning, unit SOP's and training must be relied on for efficient execution of the mission. Warning orders are issued well in advance to allow for adequate planning time. Flight routes are selected which offer minimum interference from enemy forces and maximum cover and concealment. Nap-of-the-earth flight is used as necessary. En route formations will be determined by the factors of METT. When the airmobile force is of such size that flank security at extended distance is required, a portion of the armed helicopter force may be given a flank security mission and the balance of the force will escort the formation. The number of armed helicopters used to escort airmobile forces will vary. A ratio norm is one fire team to four airlift helicopters for small or loose formations, and one fire team to six troop-carrying helicopters for larger, more cohesive formations. The armament used on armed helicopters will depend upon the nature of known and suspected enemy targets. Armed heli-

copters selected for escort ideally have a greater speed capability than the transport helicopters. This will allow the escorts to depart the formation and return, and permit lead escort helicopters to accompany the formation up to the latest practical time prior to departing on landing zone reconnaissance and prestrike, and suppressive fire missions. Centralized control of the entire airmobile force (troops, airlift helicopters, and armed escort helicopters) is essential during the operation. This control normally is vested in the airmobile force commander.

b. Conduct of Escort Operations for Airlifted Forces.

- (1) Armed helicopters provide security for the airlifted forces during the loading phase. Once the airlifted force is airborne and en route to the objective area, armed helicopters are responsible for the destruction or neutralization of enemy forces which threaten the formations. Escort helicopters are deployed in advance, along the flanks, and to the rear of the formation. Escort formations should remain flexible, and the armed helicopter mission commander should continually adjust his elements to maintain 360° protection. If the force is threatened or attacked, suppressive fires will be placed upon the enemy until the airlifted force has passed out of range or until the enemy is neutralized. If the enemy target is not neutralized, the supported unit leader is notified so that subsequent lifts will avoid the known enemy position.
- (2) Mechanical failure or enemy action may force transport helicopters to abort prior to reaching the objective area. If possible, escort helicopters will provide security and fire support for crews and troops of the downed helicopter until they can be rescued. Rescue may be facilitated by employing empty transport helicopters returning from the landing zone or by supporting medical evacuation helicopters.
- (3) As the airmobile force nears the landing zone, designated armed helicopter escorts will conduct the landing zone reconnaissance. The composition of the reconnaissance force is dependent upon the escort

strength available, the size of the landing zone, and the time available for conducting the reconnaissance. The armed helicopters should approach from the flanks of the landing zone, avoiding the open areas, since these will probably be the enemy's best fields of fire. Initiating the reconnaissance from the flanks forces the enemy to fire from a less desirable position. The armed helicopter mission commander will designate specific portions of the landing zone for each armed helicopter to cover, based on prior intelligence, aerial photographs, and maps of the area. The armed helicopter mission commander will instruct his fire teams to search for and note exact locations and dispositions of enemy troop positions, antiaircraft weapons, and automatic weapons. Reconnaissance by fire will be employed as necessary. In addition to locating enemy positions, the condition of the landing surface will be checked for obstacles such as poles stuck in the ground, cables strung across the area, and indications of mines or demolition charges. Upon completion of the reconnaissance, the armed helicopter mission commander should report to the airmobile force commander with a recommendation that the mission be continued or aborted. This report must be given in sufficient time for the airmobile force commander to react.

- (4) Armed escort helicopters may be assigned the mission of prestriking the landing zone. Well-timed suppressive fires, violently executed, will significantly reduce the enemy's capability to repel the airmobile assault force. The armed helicopter mission commander should consider giving priority to the expenditure of sufficient ammunition to make the prestrike effective and yet not sacrifice the capability of performing subsequent missions. An ineffective prestrike negates the element of surprise and leaves the enemy alerted to the impending airmobile assault. Prestrike fire support should be maintained until the airlanded force has engaged the enemy. *There should be no time gap between the prestrike and the*

assault of the airlanded force. Any time interval between these fires gives the enemy time to reposition weapons and troops and to replace gun crews without interference. When they arrive in the landing zone, the striking helicopters will be augmented by the suppressive fire of escort helicopters that remained with the airmobile formation. When firing in the landing zone, the escort helicopters should maintain a minimum altitude of approximately 100 feet above the terrain to permit the transport helicopters to add their weapons fires during their approach and departure from the landing zone. Escort helicopters will engage targets to assist the ground assault but must be prepared to provide suppressive fire support for the empty transports upon their departure to the specified flight altitude or release point.

- (5) Armed helicopters may be required to deliver smoke on enemy positions or to lay a screen between the enemy and the landing zone to conceal the arrival of the airmobile force. Wind and weather must be accurately evaluated immediately prior to the use of smoke. Smoke could severely hamper the airmobile force if improperly employed.
- (6) Subsequent to the debarkation of the airlanded force, a portion of the armed helicopter escort may be designated to remain in the landing zone area to support the ground elements by fire support and reconnaissance.
- (7) As the empty troop transport helicopters depart the landing zone, they are escorted to a specified flight altitude or release point by elements of the armed helicopter force. This escort force will cover the departure route with suppressive fire. The escort mission commander must insure that, as the transport helicopters begin their liftoff, his fire teams are in a position to conduct effective fire suppression of the departure corridor. Normally, this will require the fire teams to be located behind and below the transports as they climb out.

Note. At the discretion of the appropriate commanders, the escort force may be ordered

to return to the vicinity of the landing zone for the support of the committed ground forces during critical phases of the ground assault.

- (8) The entire airmobile operation, from the planning phase through the execution of the ground attack by the airlanded infantry, requires precise timing that can be achieved only through detailed planning, coordination with all units concerned, thorough briefings, reliable communications, and, if time permits, thorough rehearsals.

48. Escort of Ground Convoys

The threat of ambush to ground convoys is usually present in defensive or retrograde situations in restrictive terrain such as jungle, and in operations against an enemy adept at infiltration. Stability operations will frequently require aerial escort of ground convoys; general warfare operations will require convoy escort in the combat or communications zone when security is essential. The ambush threat can be greatly reduced by using an armed helicopter escort for the convoy.

a. Planning Considerations. The armed helicopter mission commander should conduct a thorough map reconnaissance of all proposed routes, alternate routes, and adjacent terrain. He should establish a system of checkpoints, phase lines, and holding areas to be used by his armed helicopter escort. These control measures must be coordinated with the ground convoy commander. If time and security permit, a route reconnaissance should be made prior to conducting the convoy escort. Coordination for refueling and rearming must be effected if the escort of the convoy is expected to require more time than helicopter fuel endurance permits. After coordinating with the convoy commander, the armed helicopter mission commander should consider placing fuel and ammunition in the ground convoy. Other coordination with the convoy commander should include—

- (1) Number and type of vehicles in the column.
- (2) Radio frequencies, call signs, and/or visual signals.
- (3) Primary and alternate routes of advance.
- (4) Starting time, starting point, rest stops, and release points.
- (5) Armed helicopter and ground convoy prearranged actions, if attacked.

b. Conduct of the Mission. The mission may be conducted by an armed helicopter force employ-

ing one fire team as an advance reconnaissance element, with the balance of the armed helicopters composing a strike force positioned over the moving column. The reconnaissance elements should reconnoiter at an altitude based on the factors of METT, searching at least 1,500 meters on either side of the route. The reconnaissance effort should be directed toward determining the condition of the route, obstacles along the route, and enemy positions or terrain that dominate the route. The reconnaissance element relays all pertinent information to the armed helicopter mission commander, using the spot report technique. This includes negative reports at frequent intervals. The helicopter strike elements provide protection directly over and adjacent to the column. The strike force normally will fly in 360° orbits or S patterns over the column, reconnoitering terrain features immediately adjacent to the route. This force must be prepared to support both the aerial reconnaissance elements and the ground convoy.

49. Actions To Counter Enemy Aircraft Attack

If enemy armed aircraft attack friendly armed helicopters, defensive tactics are required to effectively counter the attack. The following considerations should be included in the formulation of defensive tactics:

a. When en route to accomplish any mission, the armed helicopter force will maintain a constant search of the skies to facilitate detection of enemy aircraft at the earliest possible moment. A brief, clear report should be standard operating procedure for alerting the armed helicopter force of the approaching enemy aircraft; e.g., "Dragon 36; 8 bandits, 3 o'clock high, 2 miles."

b. Should the enemy force be composed of helicopters, the armed helicopter escort should make every effort to prevent the enemy force from penetrating the formation under escort. Destruction of the enemy force outside the formation will allow continuation of the major mission.

c. The armed helicopter force will take immediate evasive action to avoid destruction by enemy high performance aircraft. Nap-of-the-earth flight techniques should be used, since high performance aircraft have a limited capability to effectively maneuver at this altitude. Rapid and violent changes in direction, employing the rotary wing maneuverability advantage, reduce the enemy's success in attacking the slower-flying

armed helicopters. When the armed helicopters are operating as a part of an airmobile force and the force is attacked by enemy high performance aircraft, the entire force must take evasive action as described above.

d. Tactical support aircraft on air alert will be requested to counterattack enemy aircraft. The call for friendly air support should be transmitted over the designated tactical air request channel and should include the location, number, and type of attacking enemy aircraft. If high performance aircraft have been assigned to provide cover for the mission, this request will be transmitted over the prearranged radio frequency specified in the mission briefing.

50. Retrograde Operation

A *retrograde operation* is a movement to the rear or away from the enemy. These operations may be forced by enemy action or may be made voluntarily. In either event, such an action must be approved by the appropriate higher commander. A well-planned, well-organized, and aggressively executed retrograde operation provides opportunities for inflicting heavy damage to enemy troops and materiel. In conducting a retrograde operation, armed helicopters will be used to inflict maximum damage on the enemy forces through counterattacks, traps, and canalization of attacking forces. Missions performed by armed helicopters in support of retrograde operations include—

a. *Reconnaissance by Fire.* Reconnaissance by fire is conducted to the front and flank of the supported unit to give early warning, and to delay and harass the enemy's advance elements. The armed helicopter reconnaissance force should be sufficient to provide attack strength, operating flexibility, and area coverage. In conducting reconnaissance by fire, the mission commander must consider the following:

- (1) Coordination with the ground force commander of the overall tactical plan and the areas, spaces, and routes to be reconnoitered by fire.
- (2) The disposition of friendly forces will be fluid in a retrograde operation, and the armed helicopter mission commander must insure that he has communications with ground elements at all times.
- (3) Coordination with the artillery liaison officer or observer to determine areas of

friendly artillery fire, and to plan on-call fires in the armed helicopter force area of responsibility.

- (4) While conducting the reconnaissance by fire, elements of the armed helicopter force will fire at suspected targets in their area, zone, or route. If unable to destroy enemy elements, every effort will be made to delay, disorganize, and harass their advance.
- (5) The location of servicing areas is critical to the successful conduct of retrograde operations. Transport helicopters should be used to deliver fuel and ammunition to predesignated areas on call. The arrival of the armed helicopters and the transport aircraft at the servicing area should closely coincide. The armed helicopters will refuel, rearm, and depart the site expeditiously. This method of refueling/rearming reduces the security that is required when fuel and ammunition are prepositioned.

b. *Fire Support of Holding Forces.* Special considerations associated with fire support to holding forces are—

- (1) The fluid disposition of friendly forces must be known to the armed helicopter mission commander. Direct communication with the holding force is essential. Fire support coordination channels may be used for this purpose.
- (2) Fuel and ammunition for the armed helicopter force should be located in a relatively safe area to the rear of the holding force.

c. *Escort of Airmobile Withdrawal of Covering Forces.* The availability of armed helicopters provides the commander with a significant advance in techniques of conducting all types of retrograde operations or disengagements with the enemy, either as part of a withdrawal, in the conduct of a mobile defense, or in achieving separation distance for the employment of nuclear weapons. Ground forces in contact with the enemy are essentially holding the enemy by fire and maneuver. In order to withdraw them in good order it is necessary to provide a substitute fire and maneuver means. Armed helicopters are ideally suited to this task. Initially, the force to be withdrawn is provided all available artillery and close air support. Transport helicopters, escorted by

armed helicopters, move to the rear of the forces to be withdrawn. A portion of the armed helicopters participates in bringing fires on the enemy while others secure the LZ. On prearranged signals the ground force withdraws to the LZ as the tempo of aerial fire support increases. Consideration should be given to the shifting of artillery and

close air support to protect the LZ's from envelopment by the enemy force. Upon extraction of the ground force the armed helicopter force breaks contact and intensive artillery and close air support fires are employed to minimize enemy interference with the movement of the transport helicopters.

CHAPTER 7

SPECIAL OPERATIONS

Section I. NIGHT OPERATIONS

51. General

Armed helicopter night operations offer an excellent opportunity for achieving deception and surprise, thus enhancing the success of the mission. Armed helicopters may perform fire support, reconnaissance, fire adjustment missions in support of ground operations, and other conventional armed helicopter missions. The fundamentals involved in night operations are the same as those in daylight operations, although techniques may vary. For example, more control measures will be placed upon armed helicopter units during night operations than during daylight operations. Mission success is dependent upon prior reconnaissance, simple plans, accurate navigation, the night training proficiency of flight crews, and thorough coordination between all elements involved.

52. Training

All armed helicopter crew duties must be established and thoroughly practiced in training.

a. Aviators.

- (1) *Fire support.* Attack patterns must be practiced with live ammunition to teach the gunners the techniques of engaging targets during periods of minimum visibility. Range estimation is a major consideration in fire support training. In the absence of battlefield illumination, aviators will tend to underestimate ranges; they should develop techniques to compensate for this tendency. For example, increasing the initial estimate by one-third will result in an approximately correct estimate of range to the target. Formation flying should be practiced, both for independent fire support missions and for armed escort of airmobile operations.
- (2) *Navigations.* Night navigation must be

thoroughly practiced using available electronic aids, but with emphasis on pilotage and dead reckoning techniques. The terrain in areas of night deployment should be studied for possible enemy positions and avenues of approach into and out of the area. Easily identifiable checkpoints should be noted and attacks planned to make use of these features, both with and without illumination. If the situation permits, the operation should be rehearsed.

- (3) *Night observation.* Aviators must be trained in the techniques of night observation, to include measures taken to prevent the loss of night vision. Off-center scanning techniques must be practiced by all crewmembers.
- (4) *Effect of enemy fire.* Enemy tracer ammunition fired at attacking helicopters appears more awesome at night than under daylight conditions and is distracting to crews. However, visually directed enemy fire normally is less effective at night.

b. Crew Duties. Crewmembers must know, in the dark, the location of all important equipment within the helicopter. This equipment includes such items as fire extinguishers, grenades, extra ammunition, and first aid equipment. Preflight and postmission duties, such as maintenance inspection, reloading of weapon systems, refueling, and defensive parking of aircraft, should be covered by standard procedures for all night operations.

53. Control Measures

The following control measures normally are used in the conduct of night armed helicopter operations:

- a. Release Point.* A release point will be estab-

lished in the vicinity of the target area. Armed helicopters are released from formation control at the release point and proceed in the attack of the target area.

b. Orbit Point. An orbit or rallying point may be established in the vicinity of the battle area so that helicopters can be quickly assembled at any time during or after the attack. This point should be readily identifiable by a navigation fix or by relative position to prominent terrain features such as rivers and towns.

c. Altitude. Night attacks by armed helicopters are initiated from higher flight altitudes than in daylight operations. Normally, it is not feasible to make nap-of-the-earth firing runs at night without illumination or special visual aids. Termination of firing runs should also be completed at a higher altitude, especially in uneven, hilly or mountainous terrain.

d. Attack Headings. The armed helicopter mission commander or a control aircraft situated overhead can give attack headings to be flown for the firing runs. Vectoring facilitates control and reduces confusion in the target area.

e. Troop Safety Buffer Zone. A larger troop safety buffer zone must be established for night operations which will preclude armed helicopters from firing into friendly positions. Its location should be defined by easily identifiable terrain features or lighting devices.

f. Formations. Night formations will require greater separation between helicopters. Minimum lighting of a type to preclude observation from the ground should be used during formation flying over hostile areas.

g. Attack Patterns. Night attack patterns must be simplified since they are more difficult to judge and control. For example, attacking in a simple trail pattern facilitates visual contact between helicopters and allows for ready determination of the direction of movement of other friendly armed helicopters. Normally, attacks will be made parallel to the line of contact to prevent inadvertent firing on friendly positions.

54. Special Considerations

a. Target Acquisition. Targets will be more difficult to acquire at night because of restricted visibility. Aids to night target acquisition include—

- (1) *Illumination.* Illumination of targets is accomplished by aircraft flares, artillery

illuminating rounds, and ground or helicopter searchlights. The illumination will disclose enemy positions that are not camouflaged and will generally disrupt enemy troop night vision. When illumination from aircraft flares or artillery illuminating rounds is employed, the enemy is generally unable to determine helicopter attack patterns if the helicopter force does *not* penetrate below the altitude of the flares or within the perimeter of the illuminated area. Searchlights will also provide effective illumination of the target area; however, helicopter searchlights should be used only intermittently to preclude continuous enemy tracking of armed helicopters. Friendly units must be informed when and where illumination will be employed.

- (2) *Other.* Other aids to night target acquisition include airborne and ground radar and infrared devices, muzzle flash from enemy weapons, and poor light discipline by enemy troops.

b. Helicopter Special Lighting Equipment for Night Operations.

- (1) *Cockpit.* The panel lights should be as dim as possible. When a target is acquired and the attack begins, panel lights should be turned to full bright, since dim instruments will be difficult to see after looking at tracers or burning rocket motors. The dome lights should not be used. Flashlights should be used only when necessary for map scrutiny, etc., and then as briefly as possible and with red lens covers. Maps should not be marked in red as markings will not show up under red light.
- (2) *Exterior.* If the helicopter is not equipped with special night lighting devices, the following guidance should be followed:
 - (a) Only those lights essential to successful conduct of the mission and maintenance of helicopter separation should be used.
 - (b) In an emergency, additional exterior lighting should be used to aid other aircraft in locating the affected helicopter. When located, its lights should return to normal. If an aircraft is

forced down in a hostile area, lights should be used only as necessary until its location has been determined and acknowledged by another aircraft.

- (c) The searchlight and landing light should be in the extended position so that they can be quickly used if the helicopter is forced down.

c. Effect of Enemy Searchlights. Enemy searchlights focused directly on attacking helicopters seriously impair the crew's night vision. This impairment could result in unsafe operation of the helicopter. Evasive action must be initiated immediately to avoid protracted exposure in the searchlight beam. A new attack direction and approach angle should be selected that will restrict the capability of the enemy searchlight. All exterior helicopter lighting should be extinguished to decrease the likelihood of visual acquisition. When feasible, the searchlight should be destroyed by fire.

55. Helicopter Servicing

a. Approach and Landing. Helicopters will make approaches to a lighted servicing area, and ground personnel will guide the helicopter to pre-selected parking locations within the area. They should land in a prearranged sequence to expedite parking by ground crews. If possible, the armed helicopters should approach and land at the pre-selected parking locations, thereby eliminating

hovering and movement in the servicing area. Aircraft should be parked so as to preclude endangering personnel and equipment from weapons accidentally discharged.

b. Refueling. It is generally preferable to carry fuel to the helicopter rather than to hover the helicopter to the fuel source. POL supplies should be dispersed, sheltered, and concealed. Fuel trucks must be carefully guided at night to avoid collision with helicopters and ammunition stacks.

c. Rearming. Ammunition for each armed helicopter should be stacked adjacent to its pre-selected parking location. Ground crews should check with each aircraft commander for weapons status and for parts replacement, if necessary; then they should begin loading ammunition.

d. Action of Aircrews. Crewmembers will assist in servicing operations, and make a rapid check for any damage to the helicopter from enemy fire. Depending upon the number of men per flight crew, an SOP should be established assigning specific duties during servicing; e.g., the aircraft commander coordinates with the mission commander for special instructions prior to take-off; the copilot stands by ready to take off in an emergency; the crew chief checks the helicopter for damage; and the gunner begins loading ammunition. All personnel must maintain effective flight discipline.

Section II. RESCUE AND RECOVERY OPERATIONS

56. General

Downed aircraft normally will be evacuated if the enemy situation does not impose an undue hazard on recovery operations. Medical evacuation helicopters may be available for rescue with support from armed helicopters, but all armed helicopter crews must be thoroughly trained in rescue and recovery procedures, to include actions prescribed for downed crews.

57. Rescue of Downed Crews

a. Actions of Downed Crews.

- (1) *Daylight.* The following procedures are applicable to the daylight actions of armed helicopter crews downed in hostile areas:

- (a) The downed aircraft commander should contact the other fire team heli-

copter by radio, giving helicopter and crew status and information of the immediate situation.

- (b) If the helicopter is downed in an open area where a rapid rescue can be effected, the crew should normally remain in the vicinity of the downed helicopter. The aircraft commander should organize the crew to provide for security; removal of weapons, ammunition, and survival gear; and preparation of the helicopter for evacuation or destruction if the need arises.
 - (c) If the downed armed helicopter is in an area which is not generally visible from the air, procedures outlining crew actions should be provided by unit SOP. The following is a type proce-

dures which might be found in an SOP: The crew should move with minimum essential survival gear and weapons to the nearest cleared area where a pickup can be effected. Rescue aircraft should be informed of the crew's location. If communication is not possible, the crew should proceed to the clearing and, upon arrival, request pickup through prearranged signals. If the downed crew knows of no clearing in the immediate vicinity, they should notify the rescue aircraft by radio. If radio communication has failed, the crew should use prearranged smoke signal or other signaling devices. The crew should observe the rescue aircraft. It will assist by flying over the downed helicopter and out in the direction of a suitable pickup site. This maneuver will be repeated until the downed crew has reached the clearing. If the downed crew receives enemy ground fire, the general location should be indicated by a marking device, such as a smoke grenade thrown in the direction of the enemy's position. This will assist overhead aircraft in providing suppressive fire support.

- (d) Each member of the flight crew should be thoroughly trained in techniques of evasion and escape and should be equipped with a survival kit.
- (2) *Night.* The following additional considerations govern night actions of downed armed helicopter crews:
 - (a) All exterior lighting should be turned on during the descent of the downed helicopter.
 - (b) After the downed helicopter has landed, lighting must be kept to a minimum. However, if rescue helicopters are unable to locate the downed aircraft by any other means, the helicopter beacon and/or navigational lights may be turned on intermittently.

b. Actions of Armed Helicopters.

- (1) The armed helicopter rescue force will obtain a radar fix on the downed helicopter, if possible. After locating the downed helicopter, it should avoid orbiting directly overhead since this may reveal the location of the downed helicopter to the enemy.
- (2) At night, suppressive fire by armed helicopters supporting the rescue should be discriminate since the downed crew may be firing and their muzzle flashes may be confused with enemy positions.

58. Support of Recovery Operations

a. General. Responsible commanders must carefully weigh the advantages and disadvantages of attempting helicopter recovery operations. The evacuation of downed helicopters from the battle area may be extremely hazardous under general warfare conditions. Considerations in determining whether or not to recover a downed helicopter include—

- (1) Availability of troops and aircraft to perform security and fire support for the recovery operation.
- (2) Time needed to accomplish evacuation.
- (3) Risks involved in placing a recovery force in an unsecure area that may be well beyond the range of ground supporting fires.

b. Armed helicopters will provide armed escort for the heavy lift helicopters during the evacuation, since heavy lift helicopters are vulnerable to enemy fire due to their size and slow speed when loaded. Approach and departure routes of the recovery force must be carefully selected, and armed helicopters must fly in a position to deliver immediate fire beneath the heavy lift helicopters.

c. Armed helicopters will conduct reconnaissance and security of the evacuation site. It is advisable that continuous surveillance, whatever the means, be maintained over the site until recovery is complete. If the evacuation elements come under fire, the armed helicopter force should attack the enemy positions with maximum combat power.

APPENDIX I

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- 6-20-2 Field Artillery Techniques.
- 6-40 Field Artillery Cannon Gunnery.

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- 17-95 The Armored Cavalry Regiment.
- 19-15 Civil Disturbances and Disasters.
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- 21-11 First Aid for Soldiers.
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- 29-22 Maintenance Operations in the Field Army.
- 30-5 Combat Intelligence.
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- 1-25 Rotary Wing Aircraft Gunnery: Armament Subsystem, Helicopter, 2.75-Inch Area Rocket Weapons System (ARWS, XM3).
- 1-27 Low-Level Navigation.

APPENDIX II

WEAPONS SUBSYSTEM DATA

1. General

This appendix provides basic information on armament subsystems now in use on armed helicopters. For further details on each armament subsystem, see TM 55-1520-211-10 and the armament TC's listed in appendix I. Tables I through IV below provide data on the characteristics of each armament subsystem.

2. M2 Dual Machinegun Subsystem

a. The M2 weapons subsystem (fig. 12) is designed for use on observation helicopters. It con-

sists of two M60C machineguns which are remotely controlled by the pilot. The guns are mounted upright on aluminum supporting structures on either side of the helicopter. The combined cyclic rate of fire of the two machineguns is 1,100 rounds per minute with an effective range of 750 meters. The 7.62mm ammunition for this subsystem is carried in boxes which are mounted directly beneath the guns. Each box has a capacity of 470 rounds in addition to the 80 rounds carried in the ammunition chutes, for a total of 550 rounds on each side.

Table I. Armament Subsystem Weights.

Item	Subsystem						
	M2	M6	XM3		M22	M5	XM16
	Type of ammunition						
	7.62mm	7.62mm	2.75-inch rocket		AGM-22B	40 mm	7.62mm and 2.75-inch rocket
			w/6.45-lb whd	w/10-lb whd			
Weight (lb)							
<i>Subsystem:</i>							
Unloaded.....	86.5	430	391	391	266	223.5	600
Fully loaded.....	162.5	830	1,324	1,494	650	335.3	¹ 1,268
<i>Ammunition (per round or rocket).</i>	.088	.088	19.15	22.70	64	.75	² 1,317.7
							¹ 19.15
							² 22.70
							.088
<i>Jettisonable wt (fully loaded)-----</i>	NA	NA	1,174	1,344	432	NA	368 (w/6.45 lb whd)
							418 (w/10 lb whd)

¹ 2.75-inch rocket w/6.45-lb whd.

² 2.75-inch rocket w/10-lb whd.

Table II. Range Data.

Item	Subsystem (range in meters)								
	M2	M6	XM3		M22	M5	XM16		
	Type of ammunition								
	7.62mm	7.62mm	2.75-inch rocket		AGM-22B	40mm	7.62mm	2.75-inch rocket	
			Old ¹	New ²				Old ¹	New ²
Maximum range-----	3, 200	3, 200	7, 500	9, 300	3, 500	1, 750	3, 200	7, 500	9, 300
Maximum effective range-----	750	750	2, 500	2, 500	3, 500	1, 200	750	2, 500	2, 500
Minimum employment range----	NA	NA	300	300	500	300	NA	300	300

¹ Rocket motors over 4 years old.² Rocket motors less than 4 years old.

Table III. Performance Data.

Item	Subsystem					
	M2	M6	XM3	M22	M5	XM16
Fuze arming distance (meters)---			187	300	18-37	187
Flight time (seconds)-----			¹ 1.69	22		¹ 1.69
Penetration (inches of armor)---				20		
Bursting radius (meters)-----					10	
2.75-inch rocket w/6.45-lb whd.---			6			6
2.75-inch rocket w/10-lb whd.---			8			8
Maximum rate of fire-----	550 rds/min each gun.	550 rds/min each gun.	6 pairs of rockets/ sec.	1 per 23 sec.	220 rds/min.	550 rds/min each gun and 6 pairs of rockets/ sec.
Maximum acceleration (ft/sec)---			2,300	600		2,300
Muzzle velocity (ft/sec)-----	2,750	2,750			790 (M384)	
Ammunition capacity-----	1,100 rds	6,700 rds	48 rockets	6 missiles	150 rds	6,700 rds (7.62mm) and 14 2.75-inch rockets.

¹ Rocket motor burnout time.Table IV. Angular Coverage.¹

Item	Angular limits (degrees)		
	M5	M6/XM16	M2
Outboard (right and left)---	60	70	None
Inboard-----	NA	12	None
Elevation-----	15	15	9
Depression-----	35	60	None

¹ The XM3 subsystem fires from fixed positions; the XM16 subsystem combines fixed firing of 2.75-inch rockets with flexible firing of the M6; and the M22 subsystem is wire-guided.

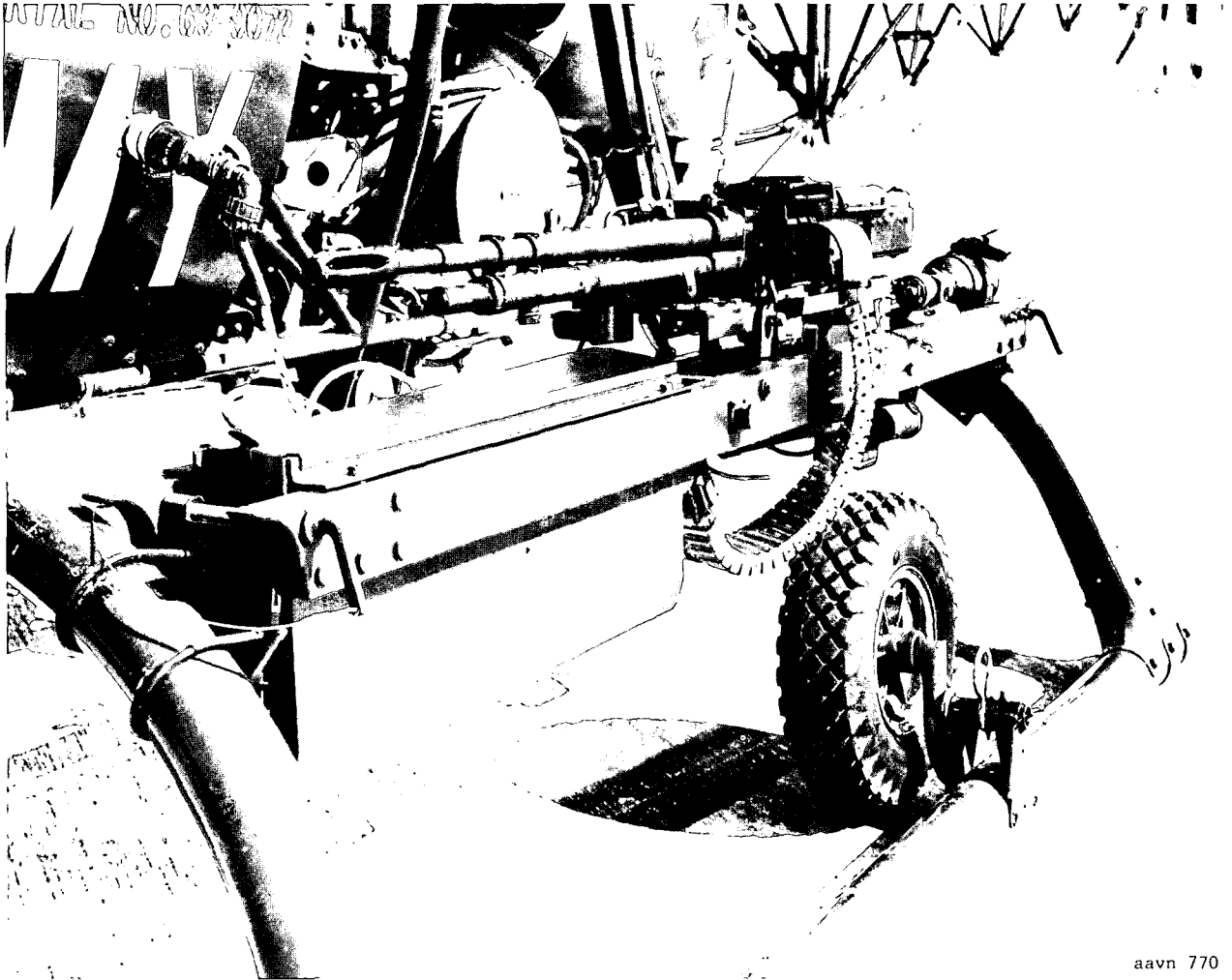
b. The weapons are fired, elevated, charged, or made firesafe by the pilot without releasing the

helicopter controls. A pneumatic charger assembly controls the charging and safety operation of each gun, and a trigger switch is used to actuate both firing solenoids. The two M60C machine-guns in this subsystem are capable of being adjusted vertically through an arc of +9°. This is accomplished by the pilot from inside the cockpit. While firing, deflection adjustments are made by turning the helicopter left or right.

c. Total weight for the subsystem with a complete ammunition load is 162.5 pounds.

3. XM3 Helicopter Armament Subsystem

a. The XM3 armament subsystem mounted on the UH-1B helicopter (fig. 13) has been adopted



aavn 770

Figure 12. The M2 7.62mm dual machinegun subsystem—left side view.

as an interim area rocket weapons subsystem. This subsystem fires the 2.75-inch folding-fin aerial rocket. A launcher pod containing 24 rocket tubes is attached to a universal mount on each side of the helicopter. A total ammunition load of forty-eight 2.75-inch rockets can be carried by this subsystem.

b. The XM3 is a direct fire area weapons subsystem which is suitable for employment against troops, lightly armored vehicles, and various materiel targets. These targets may be engaged to a maximum effective range of 2,500 meters. The minimum employable range of 300 meters is based on the fuze arming distance and crew safety. This subsystem, with its standard load of ammunition (48 rockets), weighs 1,324 pounds (with 6.45-lb warheads) or 1,494 pounds (with 10-lb warhead).

In the event of an emergency, loaded rocket pods can be jettisoned from the helicopter. Jettisoning is accomplished by using the JETTISON switch located on the rocket-armament panel. The JETTISON switch simultaneously jettisons both launcher pods by electrically firing two explosive bolts on each launcher.

c. The rocket-armament panel, mounted in the pedestal console, contains a POWER switch, an ARMED/SAFE switch, JETTISON switch, and the rotary selection switch. The selection switch enables the pilot to select the amount of ammunition to be fired. He can select a pair (single rocket from each pod) or multiple pairs of 2, 3, 4, 6, or 24 (48 rockets). A digital counter shows the number of pairs of rockets that have been fired. The pilot can determine the condition of the sub-

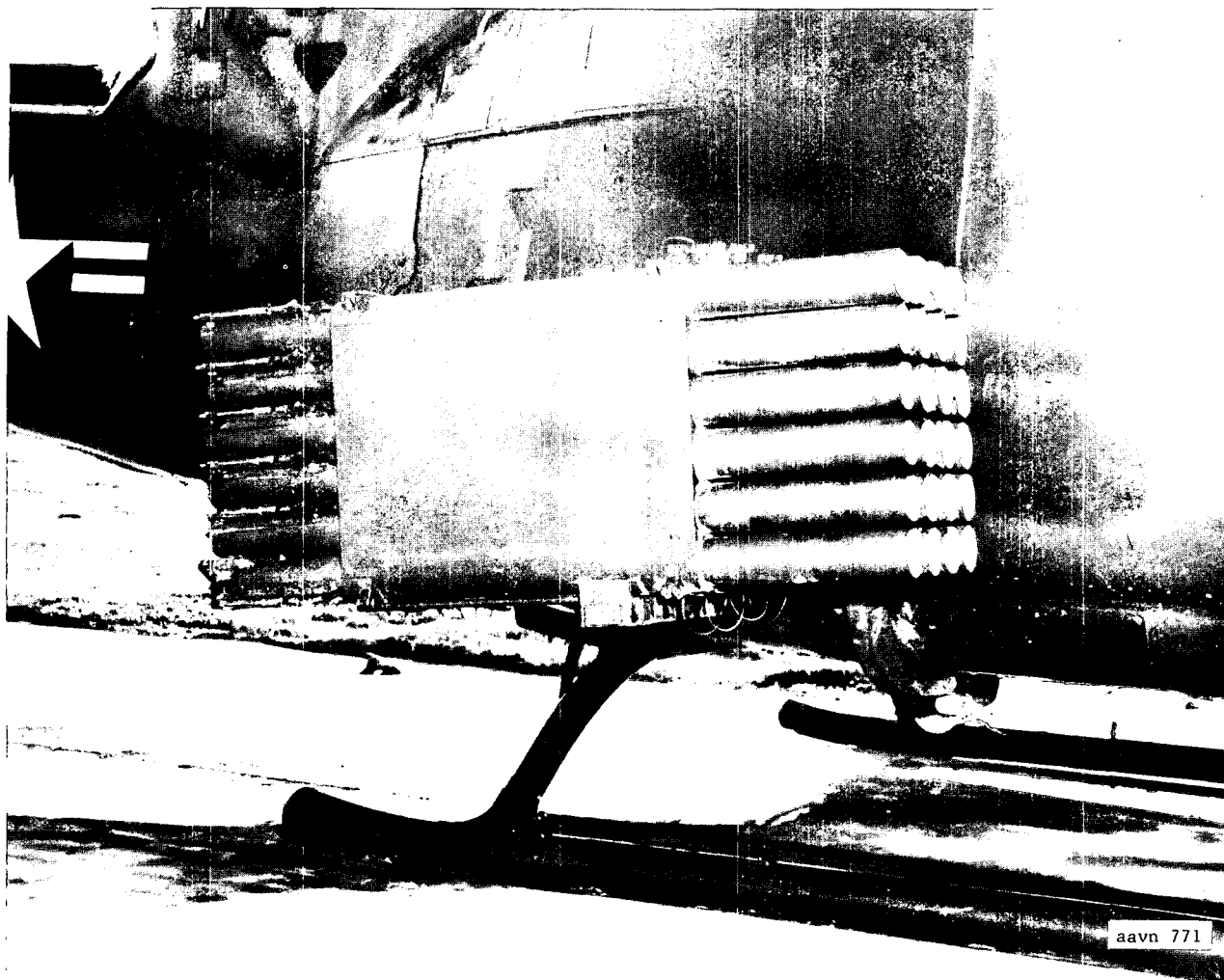


Figure 13. The XM3 2.75-inch area rocket weapons subsystem—right side view.

system by a glance at the lighted indicators on the rocket-armament panel.

d. The pilot uses the Mark 8 reflex infinity sight to align the fixed rocket tubes with the target and fires the subsystem with a firing switch on the cyclic control stick. Because the subsystem is fixed, the pilot must maintain coordinated flight during target attacks.

e. The XM3 is easily maintained under field conditions because of the rugged simplicity of its design. If battle damage makes it necessary, the launcher pods, modules, or other components may be quickly repaired or replaced.

4. M5 40MM Grenade Launcher

a. The M5 helicopter armament subsystem (fig. 14) is designed to fire 40mm grenade projectiles as a direct fire area weapon against troops,

lightly armored vehicles, and other soft-materiel targets.

b. The M5 subsystem consists of the M75 40mm grenade launcher (gun), flexible turret, and a fire control system. Through the use of the fire control system at the copilot/gunner station, accurate fire may be directed onto targets independent of the helicopter attitude. The turret contains the components necessary for positioning and firing the gun as directed by the gunner. The gun can be elevated 15°, depressed 35°, and it may be traversed 60° to the left or right. The gun may also be fired from the pilot's position in a fixed or stowed mode of fire by pressing a firing button on the cyclic stick. When firing from the stowed mode, the pilot may preset and adjust elevation through the adjustment of a wheel on the turret control panel. Deflection corrections must then



aavn 772

Figure 14. The M5 40mm grenade launcher.

be made by the pilot aligning the helicopter on target.

c. The maximum employable range in forward flight is 1,750 meters; however, the maximum effective range is 1,200 meters. For safety reasons, targets may be engaged no closer than 300 meters. The cyclic rate of fire for the M5 is 220 rounds per minute. The M5 subsystem weighs approximately 335 pounds with its maximum capacity of 150 rounds of M384 high-explosive ammunition.

d. The two types of standard ammunition currently available for the M5 are the M384 high-explosive round, with a 10-meter bursting radius; and the M385 inert practice round. The XM428E1 training round, now being developed, employs a flash device in its nose to facilitate identification of a projectile strike.

e. The copilot's/gunner's flexible sight is mounted for use at the copilot position. The sight

contains an illuminated reticle used to obtain initial and subsequent sight pictures. A flashing reticle is presented when the weapon is at a flexible limit stop, if the gun is out of phase, or if the action switch is not depressed. The weapon cannot be fired when this flashing reticle is present. The action switch and trigger switch are located on the pistol grip of the sight.

f. Ammunition is fed to the turret through flexible chuting from the ammunition storage box under the troop seats in the cargo compartment. The ammunition box holds 75 rounds in addition to the 75 rounds carried in the flexible chuting, for a total capacity of 150 rounds.

g. Due to the relatively low muzzle velocity (790 feet per second with the high-explosive round), ballistic factors affecting accuracy are increased. Gunners must be thoroughly trained in the use of the fire control system and the M5 fire control technique.

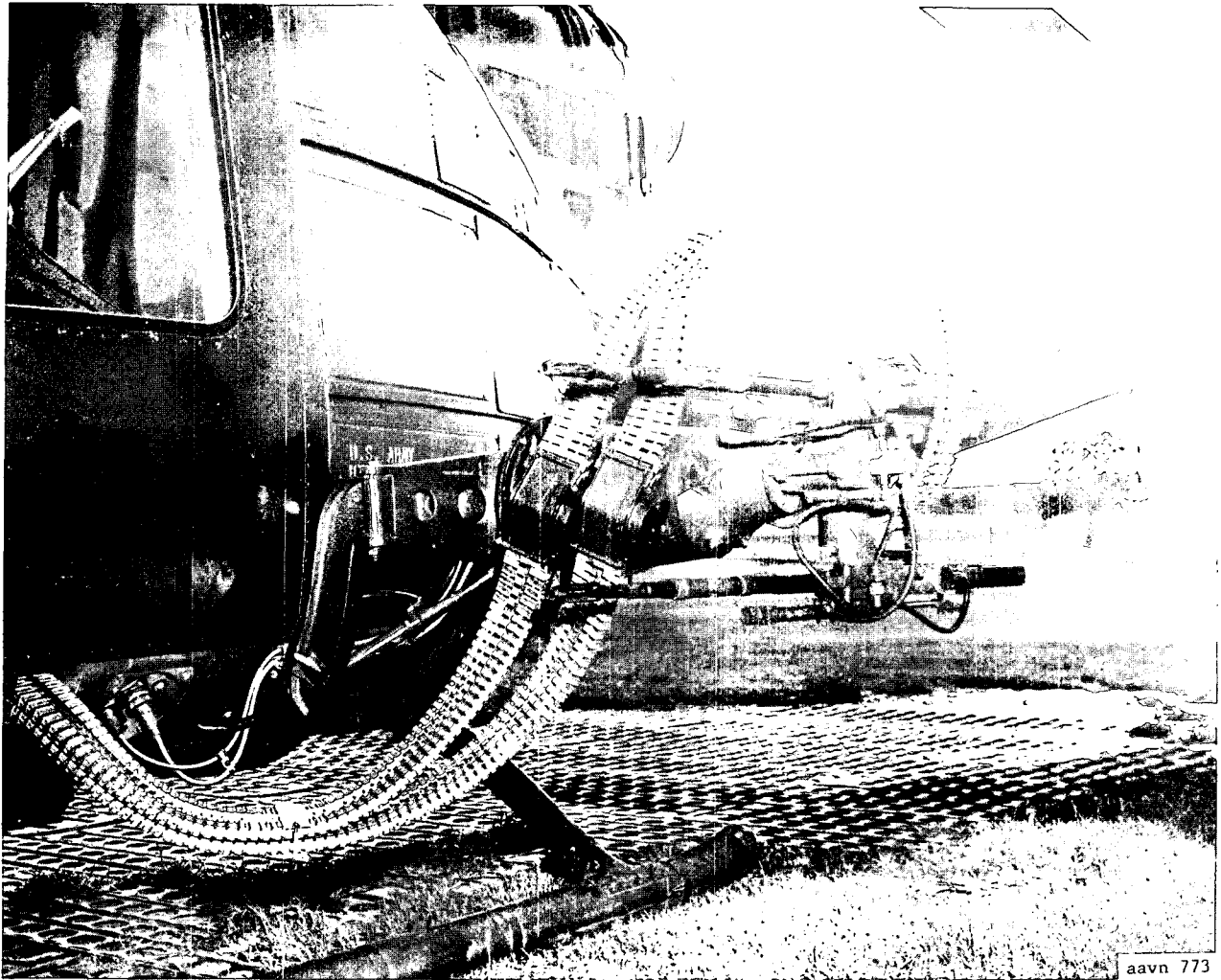


Figure 15. The M6 quad machinegun subsystem—left front view.

5. M6 Quad Machinegun Subsystem

a. The M6 quad machinegun subsystem (fig. 15) is designed to provide helicopters with an effective counterfire capability to suppress enemy ground-to-air small arms fire. It is used against enemy ground troops and soft materiel targets.

b. Two flexible gun mounts provide support for four M60C (7.62mm) machineguns and the necessary mechanisms to position them as directed by the gunner. These universal mounts are also used for the attachment of the XM3, M22, and XM16 armament subsystems.

c. These flexible guns are controlled through the use of a cockpit sight control unit (sighting station) mounted at the copilot/gunner position. The sighting station reticle illuminates when the subsystem is armed. The gunner can remotely

control the guns through their flexible limits when the action switch on the control handle is depressed. The guns can be elevated 15°, depressed 60°, and traversed 70° outboard and 12° inboard. Positive mechanical stops prevent exceeding these limits. The trigger switch is located directly above the action switch on the control handle.

d. The subsystem may also be fired by the pilot or copilot from the stowed position by using the auxiliary trigger switch located on each cyclic control stick. Adjustments for elevation and deflection must be made by changing the helicopter attitude.

e. Twelve boxes of ammunition are placed into the ammunition box tray located under the seat in the aft cargo compartment of the UH-1 helicopter. These boxes are arranged three in a row

and four rows deep. The gun feed end is to the left for rows one and two and to the right for rows three and four. Four of the eight sections of flexible ammunition chutes lead from the boxes through holes in the cargo deck to the cartridge drive motors; the other four sections of chutes lead from the drive motors to the guns. The total ammunition capacity of the 12 ammunition boxes is 6,000 rounds. An additional 700 rounds may be loaded into the ammunition chutes, making a total ammunition capacity of 6,700 rounds.

f. Each gun is attached to its mount by a quick-release latch. The guns are fed from above and the spent cases and links are ejected downward and away from the helicopter.

g. The maximum range is 3,200 meters. Due to the tracer burnout of the 7.62mm ammunition, the maximum effective range is 750 meters. However, under many conditions, effective fire can be placed on a target at greater ranges by observing the beaten zone.

h. The control panel, mounted in the pedestal console, contains an OFF-SAFE-ARMED switch, a GUN SELECTOR switch, and ARMED-SAFE indicator lights. The OFF-SAFE-ARMED switch controls the power to the subsystem and allows the crew to perform immediate action in the event of stoppage. The GUN SELECTOR switch allows the selection of either upper or lower guns only or all four guns. The green SAFE indicator light illuminates when electric and hydraulic power are applied to the subsystem and the OFF-SAFE-ARMED switch is moved to SAFE. The red ARMED indicator light illuminates when electric and hydraulic power are applied to the subsystem and the OFF-SAFE-ARMED switch is moved to ARMED.

6. M22 Antitank Guided Missile Subsystem

a. The M22 antitank guided missile subsystem (fig. 16) is a zero-launched, wire-guided subsystem capable of providing point fire support against small dimensional targets such as tanks, armored vehicles, bunkers, and bridges.

b. The subsystem, as mounted on the UH-1 helicopter, consists of six AGM-22B missiles. Each missile weighs approximately 64 pounds while the fully loaded subsystem weighs 650 pounds. The missile accelerates to a speed of 600 feet per second and is capable of neutralizing any known armor in existence today. The missiles may be fired in

a static position on the ground, or while hovering, as well as in forward flight.

c. Each missile can be selected, launched, and guided by a gunner sitting in the helicopter copilot seat. The missile is guided by a small wobble stick mounted on a control box which is directly in front of the gunner. Guidance commands to the missile are transmitted by means of two wires trailing from the control mechanism to the aft end of the missile during flight.

d. For most direct fire weapons, the probability of obtaining a hit *increases* as the range *decreases*. For the M22 subsystem, the effective hit probability range in forward flight is from 500 meters to 3,500 meters; however, this subsystem is most effective at ranges over 1,000 meters. The minimum range for effective control of the missile depends on the proficiency of the gunner, but normally is from 500 to 800 meters. This standoff capability keeps the helicopter out of range of most small arms fires and allows the gunner time to locate the missile in the optical sight and stabilize and guide the missile to the target.

e. Sighting devices in the cockpit include an inverted version of the Mark 8 sight to aid the pilot in keeping the helicopter aligned with the target from launch to impact. An M55 binocular sight at the gunner position gives the gunner a magnified view of the missile and the target.

f. The M22 is relatively simple to maintain under field conditions and has an extremely high reliability factor.

7. XM16 Weapons Subsystem

a. The XM16 helicopter armament subsystem (fig. 17) mounted on the UH-1B helicopter has proven very effective because it can fire both rockets and machineguns. This important capability affords the aircraft commander the advantage of selecting the weapon best suited to a particular target.

b. The XM16 consists of the M6 subsystem plus two XM158 aerial rocket launchers. Each rocket launcher carries seven 2.75-inch aerial rockets for a total rocket load of 14 rounds.

c. A bomb rack is used to support the rocket launcher and it is mounted just inboard of the M6 gun mount assemblies and is attached to the universal mount. The launchers can be jettisoned either manually or electrically; however, the electrical method is preferred. The stepping switch, located in the aft portion of the bomb rack, dis-



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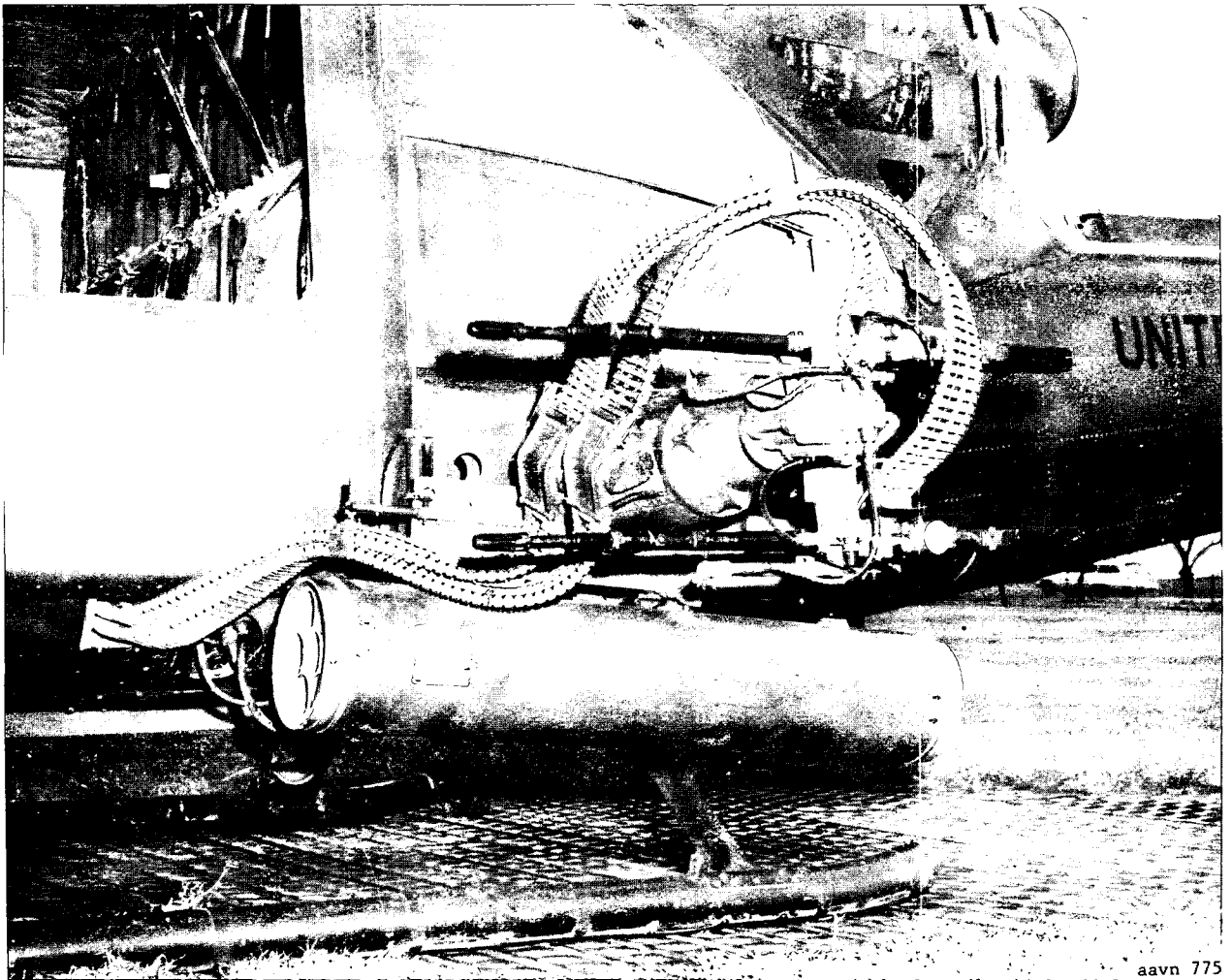
Figure 16. The M22 antitank missile subsystem—right side front view.

tributes voltage to the seven rocket tubes in the proper sequence.

d. In the cockpit, a Mark 8 optical sight is mounted on the pilot's side of the helicopter. This reflex-infinity sight is the same sight used in the XM3 armament subsystem. A light source in the base of the sight projects an illuminated reticle onto a reflector plate. The projected image has a center dot, a 50-mil ring, and a 100-mil outer ring.

Ten-mil increments are marked off vertically from the center dot.

e. Because of its dual capability, this weapons system is well suited for operational missions. For example, the pilot can engage targets to the front with the various types of 2.75-inch rocket ammunition while the copilot delivers suppressive fires to the front and flanks with the flexible machinegun subsystem.



aavn 775

Figure 17. The XM16 7.62mm quad machinegun and 2.75-inch rocket launcher—left side view.

APPENDIX III

CHECKLISTS AND REPORTS

A. Pre-mission Coordination Checklist (to be used for coordination between the supported ground unit and the armed helicopter force).

1. Situation:

- a. Unit being supported.
- b. Coordinating personnel.
 - (1) Supported.
 - (2) Others.
- c. Supporting fires in area.
 - (1) Artillery.
 - (2) Naval gunfire.
- d. Enemy estimated in area.
 - (1) Strength and disposition.
 - (2) Weapons and capabilities.
- e. Tactical air support plan.

2. Mission:

- a. Date and time of operation.
- b. Location of operation.

3. Execution:

- a. Concept of operation.
- b. Task of subordinate elements.
- c. Task of attached elements.
- d. Coordinating instructions.
 - (1) Formations.
 - (2) Routes.
 - (3) Altitudes.
 - (4) Starting and takeoff time.

4. Administration:

- a. Escape and evasion.
- b. POL, ammunition, rations.
- c. Medical evacuation.
- d. Recovery instructions for downed aircraft.
- e. Maintenance and armament support.

5. Command and signal:

- a. Frequencies and call signs.
- b. Alternate means of communications.
- c. Chain of command.
- d. Command post and commander's location.

6. Special instructions:

- a. Ground security forces for servicing area.
- b. Defense plans for servicing area.

B. Mission Planning Checklist.

- 1. Operational time schedule.

- 2. Staging area (location and parking plan, if necessary).

- 3. En route altitudes.

- 4. Approach and takeoff directions in landing zone.

- 5. Airspeed en route.

- 6. Flight routes.

- 7. Flight formations.

- 8. Use of phase lines and checkpoints.

- 9. Prestrike requirements.

- 10. Areas of suspected targets (priority).

- 11. Target designation procedures.

- 12. Emergency procedures for downed aircraft.

- 13. Medical evacuation procedures.

- 14. Use of USAF support and/or artillery.

- 15. Observers.

- 16. Class III support.

- a. Type refueling procedures.

- b. Proposed refueling time.

- 17. Radio frequencies and call signs.

- 18. Class V support.

- a. Ammunition prestocked.

- b. Ammunition to be delivered.

C. Mission Checklist.

1. Pre-mission.

- a. Crews alerted.

- b. Crews briefed.

- c. Readiness of aircraft and equipment.

- d. Preflight and runup.

- (1) Radio.

- (2) Armament.

- e. En route formation (to staging area).

- f. Radio discipline.

- g. Parking (in staging area).

- h. Logistics.

- (1) Classes I, III(A), V(A).

- (2) Special equipment.

- (a) Survival.

- (b) Maintenance.

- i. Final briefing on tactical situation.

2. During mission.

- a. Supervision of—

- (1) Tactical formations.

- (2) Escort procedures.
- (3) Reconnaissance.
- (4) Radio procedures.
- (5) Reports (Code and SOI, etc.)
- b. Evaluation of—
 - (1) Battle damage and possible repair.
 - (2) Collection and dissemination of latest enemy intelligence.
 - (3) Redistribution of personnel and equipment.
 - (4) Reports to and from checkpoint.
 - (5) Preparation for next lift or strike.
 - (6) Additional resupply when required.
- 3. Postmission.
 - a. Operational status—damage assessment.
 - b. Resupply.
 - c. Debriefing:
 - (1) Intelligence.
 - (2) Operational.
 - (a) Unit and individual performance.
 - (b) Lessons learned.
 - d. Postflight and maintenance.
 - (1) Aircraft.
 - (2) Weapons.
- D. Debriefing Checklist.
 - 1. Debrief individual flight crews.
 - a. Aircraft hits.
 - b. En route fire received.
 - c. Targets engaged.
 - d. Estimated killed in action (KIA).
 - e. Estimated wounded in action (WIA).
 - f. Ammunition expended.
 - (1) 2.75 inches SSFFAR.
 - (2) 7.62mm.
 - (3) 40mm.
 - (4) M22 ATGM.
 - (5) Small arms.
 - g. Crew injuries.
 - h. Weapons status.
 - i. Comment.
 - 2. Mission commander. (Was the concept of the operation carried out as planned?)
 - a. Flight routes.
 - b. Flight altitudes.
 - c. Flight formation.
 - d. Time schedules.
 - e. Communications.
 - f. Other.
 - 3. Mission commander. (Were the enemy situation and friendly situation valid as received at the briefing?)

- 4. Mission commander. (Were there any delays or confusion which could have been eliminated?)
- 5. Mission commander. (Lessons learned.)
- 6. Other comments.
- E. After Action Report.
 - 1. Statement of mission.
 - a. Staging area.
 - b. How mission was accomplished.
 - c. Designation of aviation unit supported.
 - d. Designation of unit supported.
 - 2. Conduct of the operation.
 - a. Departure and arrival time of individual lifts.
 - b. Enemy location.
 - c. Location of hostile fire.
 - d. Coordinates of friendly fire delivered.
 - e. Unusual incidents and delays.
 - f. Location of landing zone.
 - 3. Conclusion.
 - Was the mission completed satisfactorily?
 - 4. Recommendations.
 - a. Lessons learned.
 - b. New ideas or concepts.
 - c. Unsatisfactory techniques.
 - 5. Remarks.
 - a. Training or equipment needed.
 - b. Coordination required with other units.
- F. Fire Report.
 - 1. General.

Radio discipline is mandatory if confusion in battle is going to be minimized. Excessive radio communications block out necessary transmission, create confusion, offer the enemy more time to locate frequencies for jamming and/or injecting false information. For these reasons, a fire report transmitted from the aircraft observing or receiving enemy fire to the mission commander must be clear, complete, and brief. The report need only contain the identity of aircraft making report, type of fire, location (using clock system of reference and range estimation), and the word "smoke" (indicating that a smoke grenade has been dropped and the location of source of fire is in relation to smoke grenade).
 - 2. Factors and considerations.
 - a. Crews must be trained to use brief fire report.
 - b. Crews must be trained to drop smoke immediately upon receiving fire.
 - c. Team leaders and mission commanders

must know the location of their subordinate elements at all times.

3. Example fire report:

- a. Dragon (aircraft identification).
- b. Automatic weapons fire (type of fire).
- c. 3 o'clock. 400 meters (direction and range).

d. Smoke (smoke, as base of reference, has been dropped).

G. Aircraft, Crew, Weapons, and In-Flight Status Report.

In order for the mission commander to estimate the combat power and immediate capabilities of his unit at all times, he must receive timely reports from subordinate leaders giving the status of their aircraft, personnel, and weapons. After each major target attack (i.e., a landing zone, point

target, etc.), individual aircraft should transmit a status report to the mission commander. This report should cover whether or not aircraft are flyable, casualties, and status of aircraft weapons systems. It is recommended that such reports be given in code words to confuse listening stations (i.e., "Scorpions 1" could mean only one machine-gun in operating). A short, clear report is desirable. These in-flight reports should be given without request and negative reports should *not* be transmitted. Below is an example of an in-flight aircraft, crew, and weapons report in the clear:

1. Dragon (aircraft identification).
2. FM out, flyable (aircraft status).
3. Gunner lightly wounded (crew status).
4. Two machineguns out (weapons status).

APPENDIX IV

SAMPLE ARMED HELICOPTER FORMATION SOP

Note. This appendix contains information extracted from the combat SOP of an armed helicopter unit engaged in stability operations. It is oriented to the special situation of the area of operations—Vietnam. The SOP is reproduced to indicate the general considerations involved in combat formation flying. It does not necessarily list procedures that are applicable in all combat environments

Section I. AIR MARCH FORMATIONS

1. General

All formation flying should be in accordance with AR 95-2 and TM 1-260. The combat organization of this unit is five UH-1B armed helicopters per platoon. The platoon leader's (mission commander) UH-1B is armed with the XM3 area rocket weapons system; the other four UH-1B's are armed with the XM16 subsystem (M6 combined with XM3). The four helicopters armed with XM16 subsystems are employed as two fire teams of two helicopters each. Each UH-1B helicopter crew will consist of a pilot-gunner, a copilot-gunner, and two door-gunners. The copilot should perform navigation and look for other aircraft not in the formation. The crew chief and gunner should monitor the formation and advise the pilot when the formation is closed. Air march formations are designed to—

- a. Provide the commander with maximum command and control of his element.
- b. Expedite movement to and from operational and target areas.
- c. Provide flexibility in all situations.
- d. Afford maximum tactical employment.
- e. Reduce effects of hostile ground fire.

2. Maneuver Techniques (Nontactical)

a. Formation Flight Leader.

- (1) The formation flight leader (who may or may not be the mission commander) should make level turns at constant airspeeds and altitudes with the rate of turn not to exceed a standard rate turn (3° per second).
- (2) If a turn of 90° or greater is required, the formation flight leader should change

formation to place other helicopters in the formation outside the turn column.

b. *Pilot.* During formation flying, each pilot should—

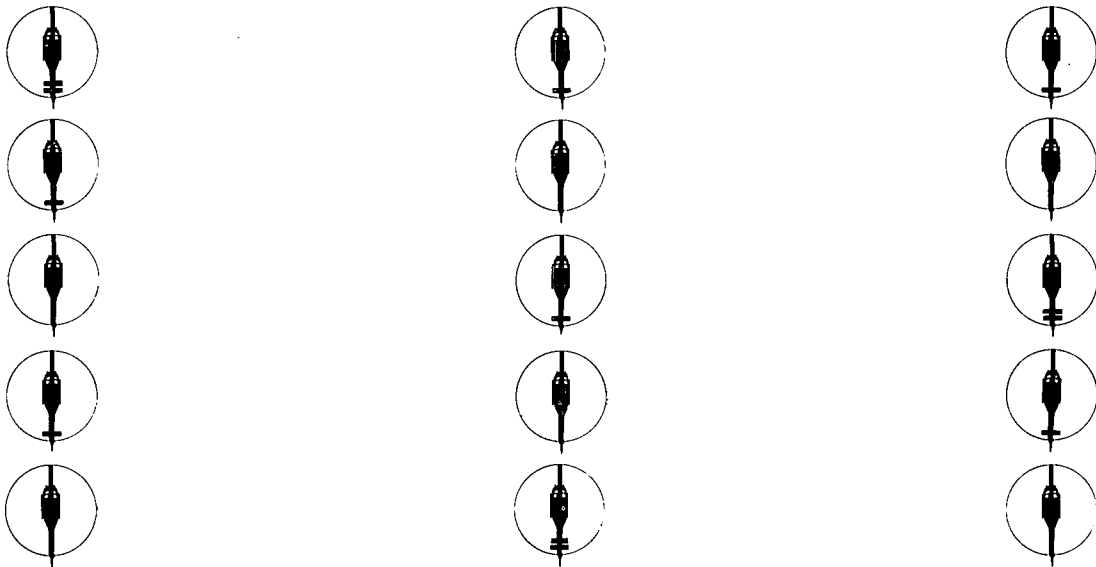
- (1) Maintain a constant power setting in level flight; altitude should be maintained within 50 feet of that specified in the march order.
- (2) Maintain an airspeed of 80 knots and a vertical speed of 500 feet per minute during climbs and descents. If a 500 fpm climb cannot be maintained, reduce airspeed to 70 knots.

3. Daylight Air March Formations (Nontactical)

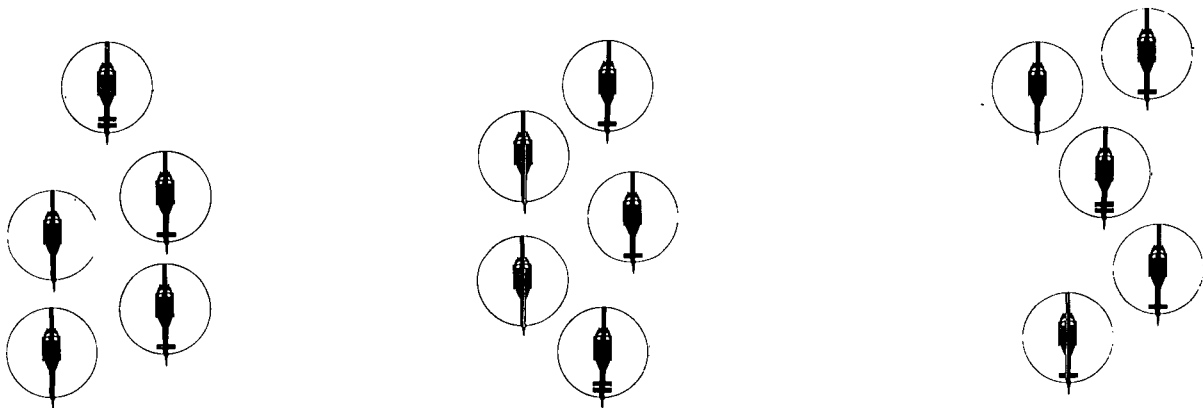
Examples of daylight air march formations are shown in figures 18 through 21. Helicopters in echelon should be flown at an angle of 45° to the leading helicopter, using the diagonal intersection of cross tubes and skids as a guide (fig. 22).

4. Administrative Landings by Escort Formation

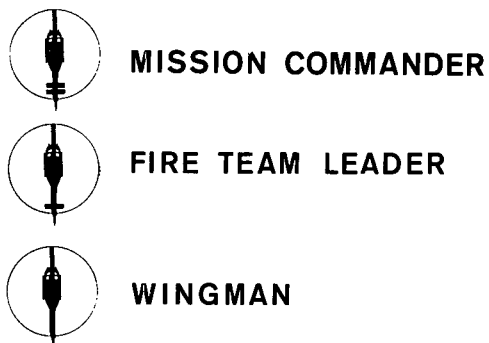
At the mission commander's discretion, administrative landings may be made by using a descending 360° overhead approach. Each helicopter pilot can initiate the maneuver at 2-second intervals by banking the helicopter in the direction of desired turn at an angle of 45° to the horizon. An 80-knot speed (UH-1) should be held in the turn and the radius of turn should not exceed 500 meters. Approach should be made at 60 knots with a 60-meter separation and landing will be in a staggered trail formation or as stated by the mission commander.



A. COLUMN OF FIRE TEAMS (15 SECONDS OF SEPARATION IS NORMAL)

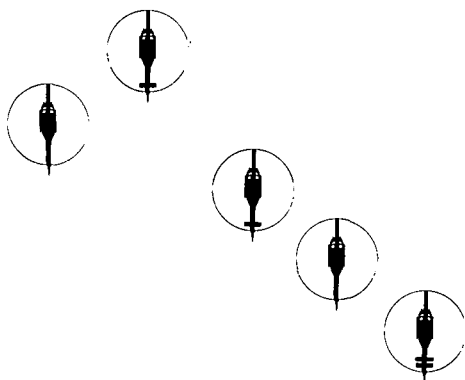


B. COLUMN OF FIRE TEAMS DURING FREE-CRUISE CONDITION

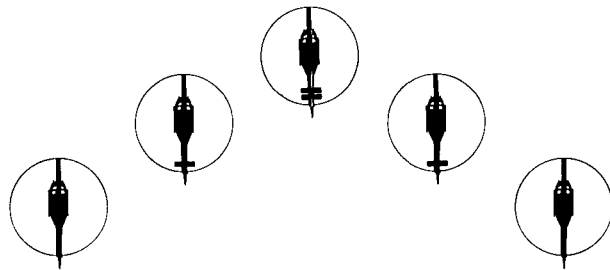


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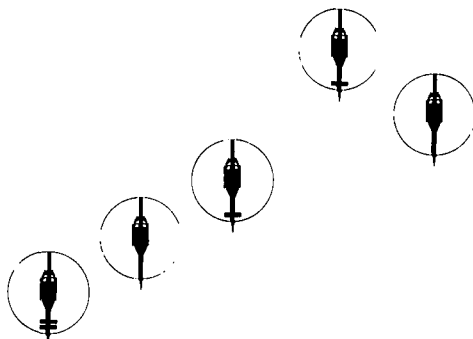
Figure 18. Columns of fire teams.



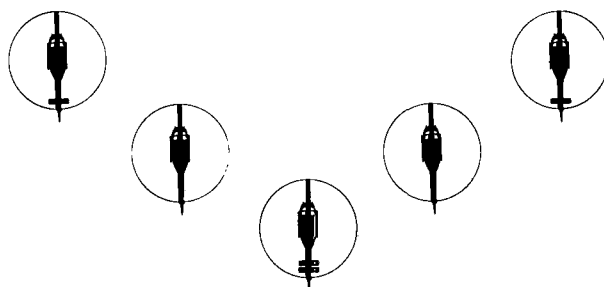
A. HEAVY RIGHT



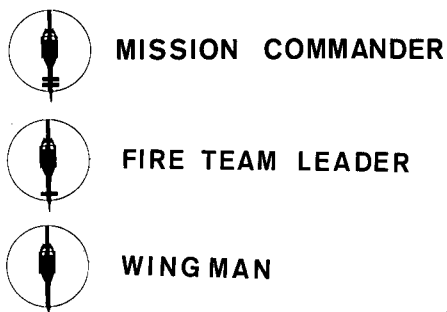
A. V FORMATION



B. HEAVY LEFT



B. INVERTED V FORMATION



aavn 777

Figure 19. Heavy right and heavy left formations.



aavn 778

Figure 20. V and inverted V formations.

5. Night Air March Formations (Nontactical)

Night flights should be in echelon formation. This formation provides better distance and depth perception by allowing lights of the adjacent helicopters (UH-1's) to appear in the sight picture. Helicopters should be flown at an angle of 30° to the leading helicopter and at a distance of two rotor disks. Navigation lights should be on steady dim over open areas and on steady bright

over populated areas. The last helicopter should turn rotating beacon on.

Note. If a malfunction occurs in the lighting system, turn the rotating beacon on and advise the mission commander.

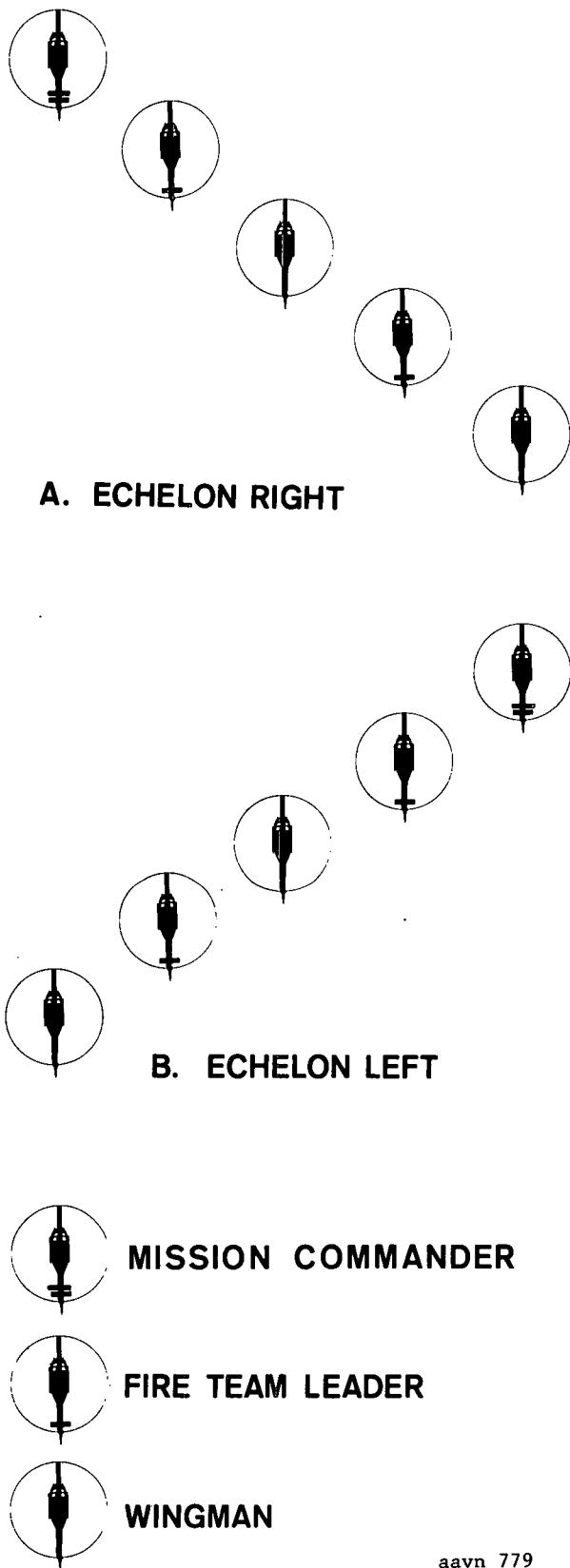


Figure 21. Echelon right and echelon left formations.

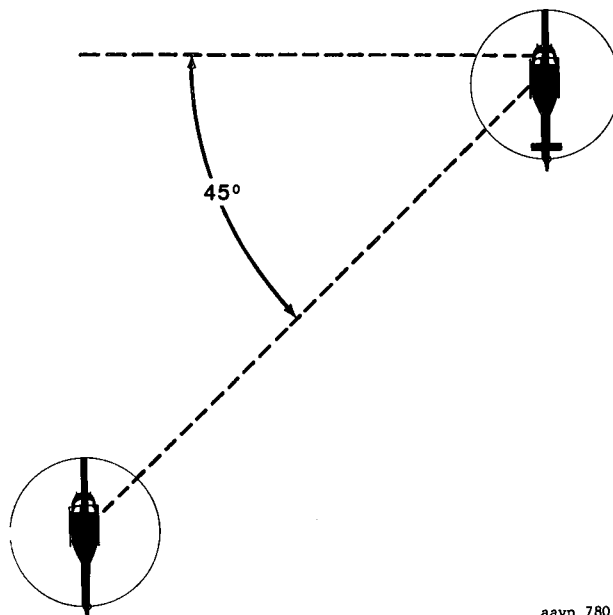


Figure 22. Sight picture (UH-1 cross tubes and skids).

6. Formation Flight at 2,500 Feet Absolute Altitude

Administrative air marches will be conducted at 2,500 feet absolute altitude. However, if this altitude cannot be maintained due to weather, the air march should be conducted at low altitudes (see para 7 below).

a. Intervals Between Helicopters.

- (1) *Close formation.* Helicopters in a close formation are separated by one rotor diameter.
- (2) *Normal formation.* Helicopters in a normal formation are separated by one and one-half rotor diameters.
- (3) *Open formation.* Helicopters in an open formation are separated by three rotor diameters.

b. *Mission Preparation.* Before each mission, the mission commander should brief each pilot on the weather, flight plan, and other pertinent information. The mission commander should insure that each pilot—

- (1) Is qualified and proficient in formation flight techniques.
- (2) Has necessary maps and charts.
- (3) Holds the required instrument pilot certificate for any portion of the flight to be conducted under instrument conditions.

c. *Staggering.* Stagger helicopters toward the rear of the formation. Staggering is accom-

aavn 779

plished by sighting the rotor disk of the preceding helicopter on the horizon.

d. Separation. Separate fire teams in column or echelon by 15-second intervals or as designated by the mission commander.

e. Changing Formation. When changing formation, helicopters should fly above and to the rear of the lead helicopter (fig. 23).

7. Low Altitude Formation Flight

a. Low Level Flight. Formation flying below 2,500 feet absolute altitude is at *tree-top level*. Formations are basically the same as at 2,500 feet absolute altitude except that lateral and longitudinal distance would be approximately 300 meters and vary as necessary to clear obstacles in the flightpath.

b. Nap-of-the-Earth Flight. At the mission commander's discretion, a free-cruise condition may be used during nap-of-the-earth flight. This will allow lateral and longitudinal distance, altitude, and position to vary in order to provide

better cover, to permit rapid maneuvering, and to increase the security of the formation. During free-cruise conditions, trail helicopters should avoid the flight path of preceding helicopters to prevent a single enemy weapon from placing anti-aircraft fire on both helicopters.

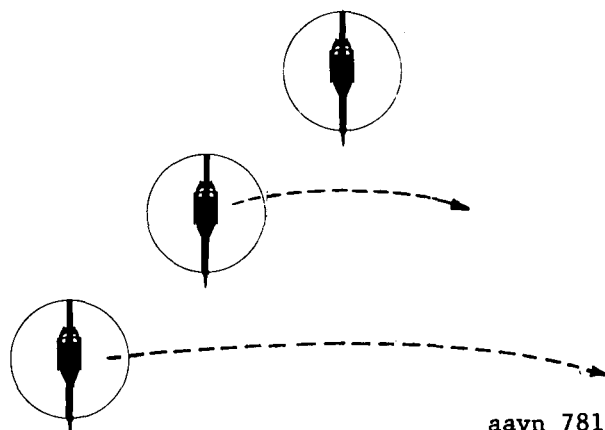


Figure 23. Changing formation.

Section II. ESCORT FORMATIONS

8. General

All principles of control, flexibility, firepower, mutual support, and exposure apply to escort formations (figs. 24 through 30). All escort formations are based on the objective of protecting the escorted elements. It is essential that armed helicopters be in position to deliver immediate suppressive fires to protect the escorted formation. Weapons' capabilities, observation, enemy, and speed differential will determine the relative positions of armed helicopters. Formations used for escort should remain flexible and the armed helicopter mission commander should continually adjust his force to provide 360° protection, regardless of the size or shape of the escorted formations.

9. Approach to Landing Zone

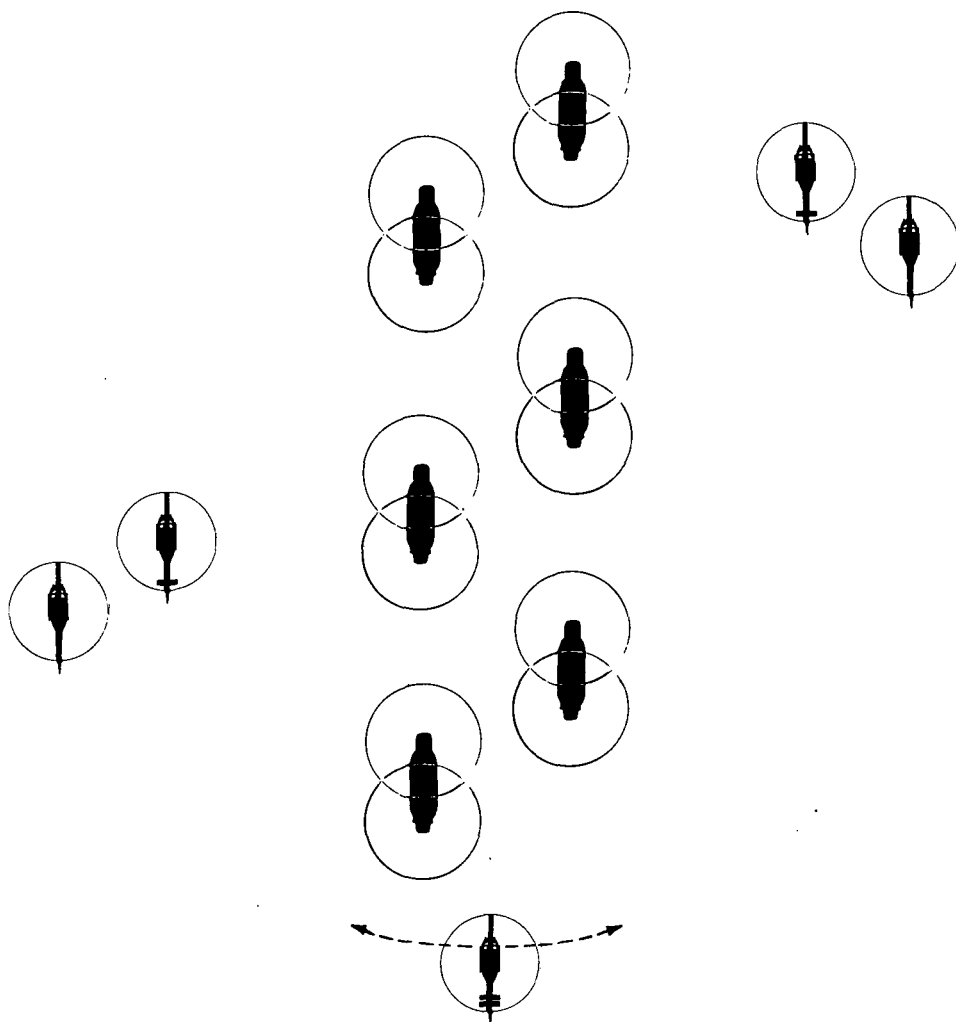
a. The escort elements should take up supporting positions in the formation immediately upon departure of the airmobile force from the staging area.

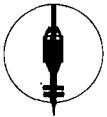
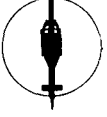
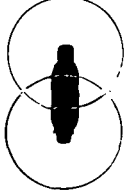
b. After the reconnaissance and/or prestrike has been accomplished and the landing zone is considered clear, the escort mission commander should advise the escorted mission commander to begin his approach into the landing zone. At this time,

the escort elements will depart the landing zone and escort the inbound flight, using the supporting positions as outlined by the armed helicopter mission commander. If, while turning into the landing zone, the inside fire team leader has to maintain an unsafe airspeed, he can execute a 360° turn and take up the wingman's position. The wingman's helicopter will then move forward into the fire team leader's former position. If there are no friendly personnel reported in the landing zone or the area has been prestruck by high-performance aircraft, the escort helicopters should place suppressive fires on the approach, flanks, and departure end of the landing zone.

10. Landing Zone Orbit

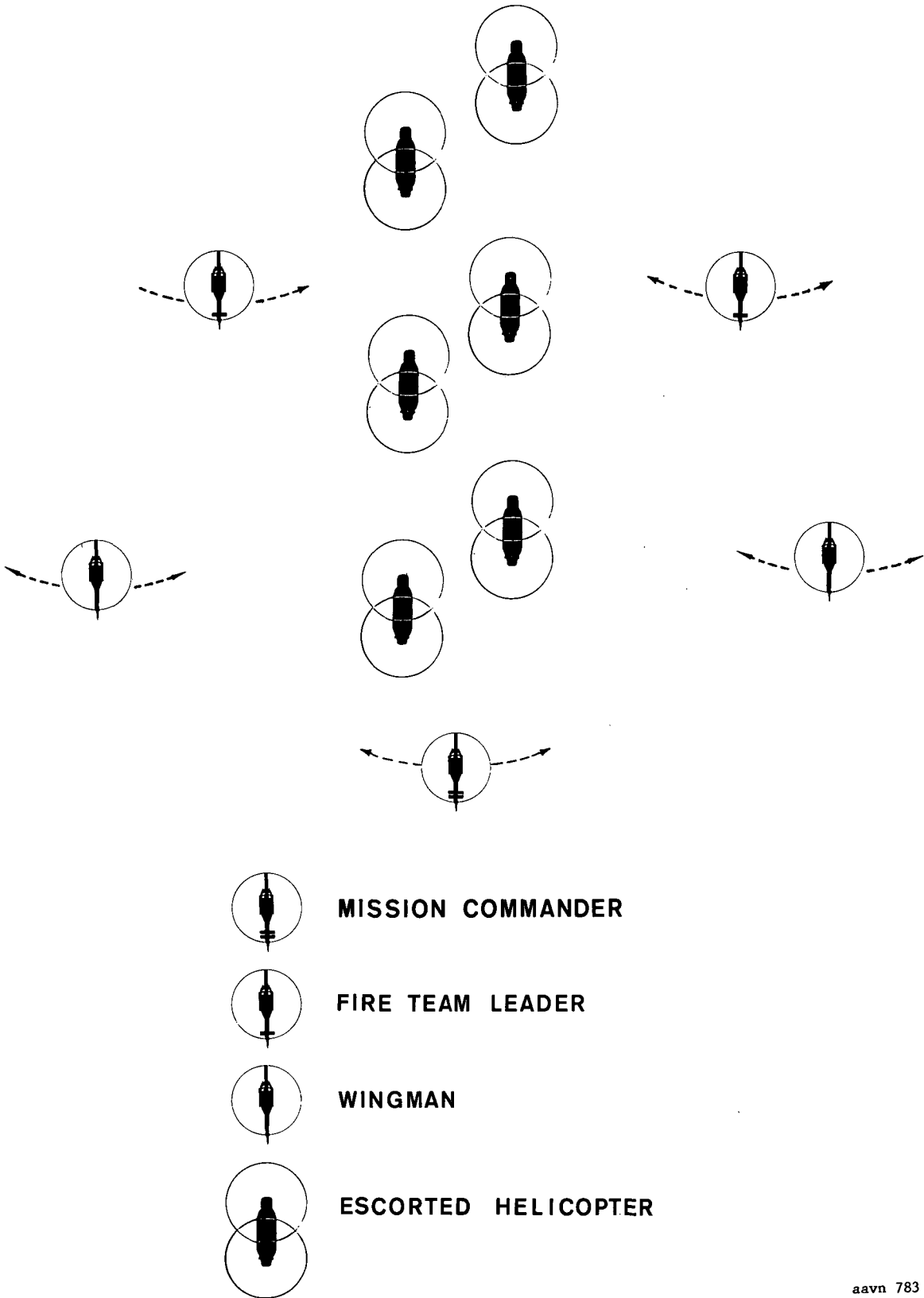
During the time the escorted helicopters are in the landing zone, the aerial escorts should execute a double orbit of the landing zone as shown in figure 26. The orbits should be flown at a minimum altitude of 100 feet to allow the escorted helicopters sufficient vertical separation to employ their pedestal-mounted machineguns, without danger to the escort helicopters. The orbit airspeed should be 90 knots. The orbit can be flown adjacent to the landing zone in position to support the escorted helicopters by fire. If the orbit is



-  **MISSION COMMANDER**
-  **FIRE TEAM LEADER**
-  **WINGMAN**
-  **ESCORTED HELICOPTER**

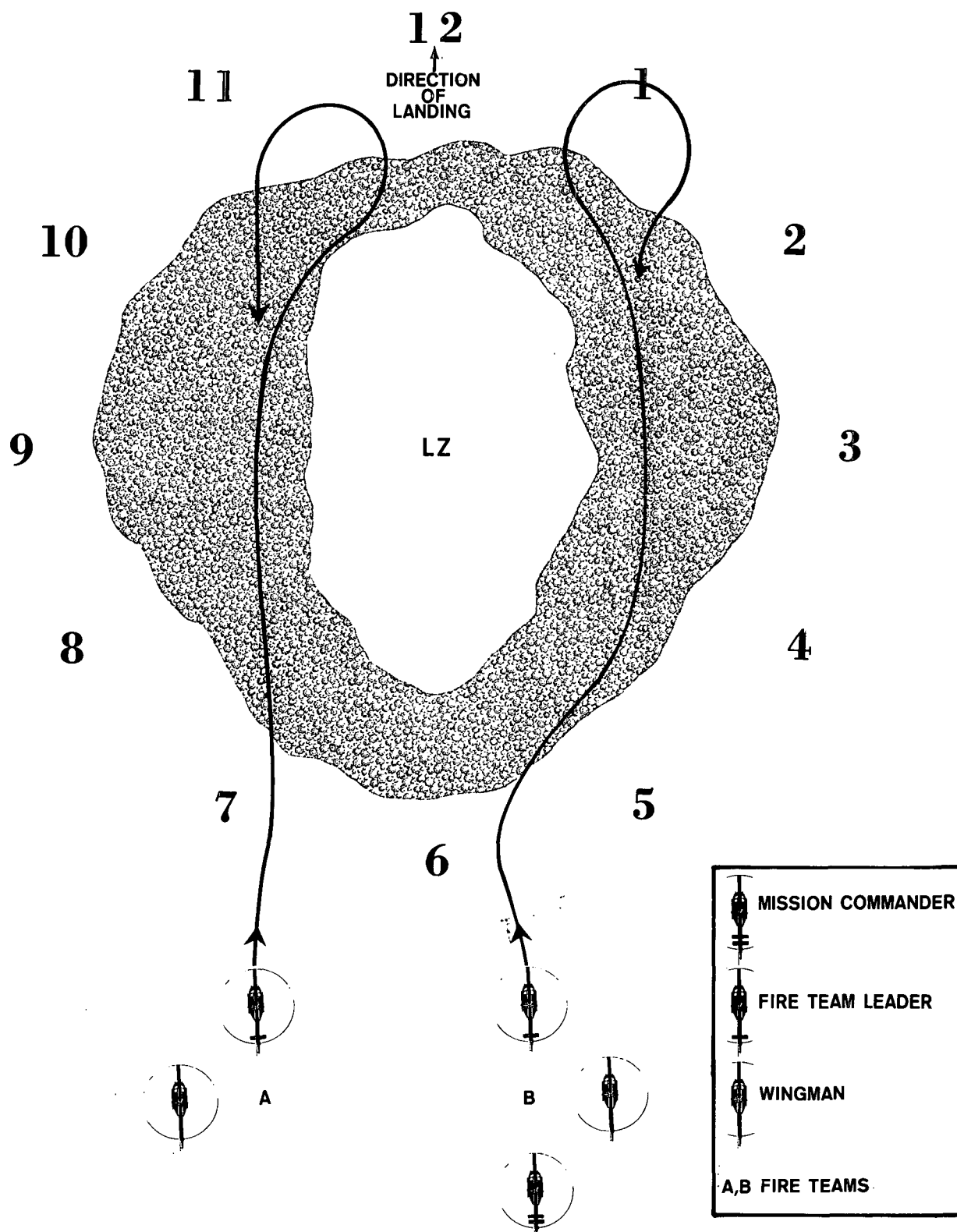
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Figure 24. Escort formation at 2,500 feet absolute altitude.



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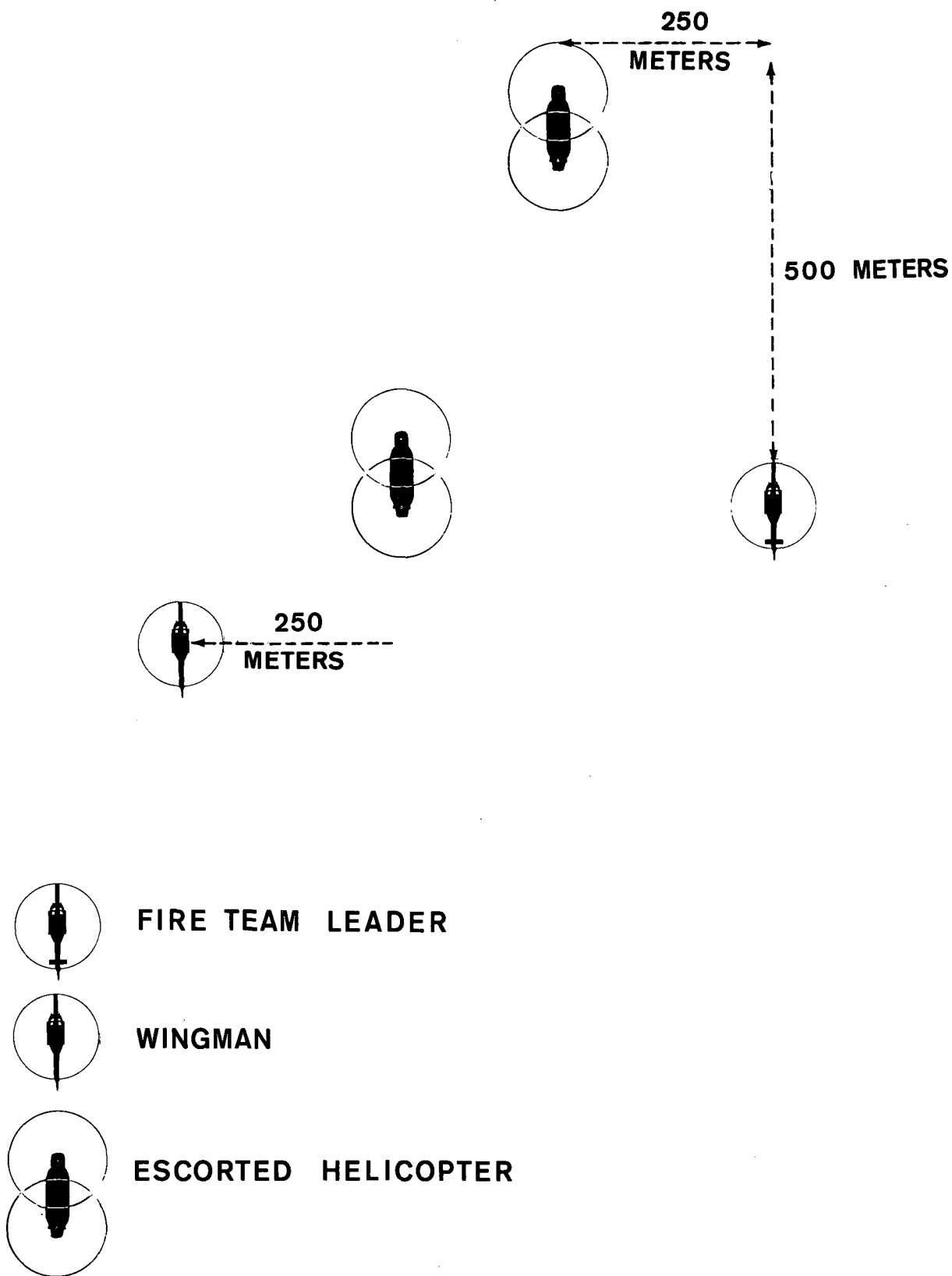
Figure 25. Escort formation at tree-top level or nap-of-the-earth.



FIRE TEAM A IS RESPONSIBLE FOR LZ COVERAGE FROM 7 TO 1 O'CLOCK.
 FIRE TEAM B IS RESPONSIBLE FOR LZ COVERAGE FROM 6 TO 2 O'CLOCK.

aavn 784

Figure 26. Double orbit of the landing zone.



aavn 785

Figure 27. Fire team escort formation at 2,500 feet absolute altitude.

over wooded areas, it should be within a 150-meter radius (dependent upon terrain) of the center of the landing zone; the fire team leader must insure that suppressive fire is placed on the areas that pose the greatest threat to the escorted helicopters.

11. Departure From Landing Zone

a. The escort for the departure of the escorted helicopters will be initiated by order of the armed helicopter mission commander. The following indications will alert the armed helicopters that pickup is imminent:

- (1) Radio transmission by escorted helicopters, stating their departure time.
- (2) Evacuation of all troops from the transport helicopters.
- (3) Increased rotor wash from the transport helicopters; dirt or water blowing upward in the landing zone.

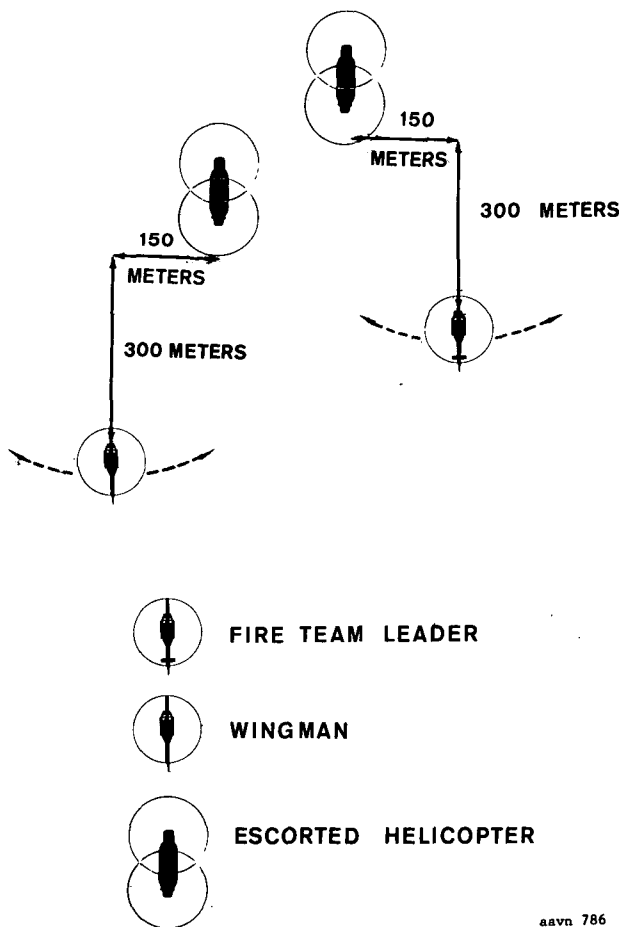


Figure 28. Fire team escort formation at tree-top level or nap-of-the-earth.

b. When the transport helicopters are ready to depart from the landing zone, they will be flanked by armed helicopters and escorted to formation flight altitude (para 6 and 7). However, in subsequent airlifts, friendly fire by the escort helicopters should be coordinated with the force on the ground. See figures 27 and 28 for fire team aerial escort formations of a small airmobile force. The armed helicopter mission commander should request the escorted mission commander (transport commander) to maintain his formation as tight as is tactically possible. This will facilitate escort of the formation and increase the density of friendly escort fires that can be placed to support the total formation.

c. If the fire team is reinforced, the mission commander's helicopter normally will be in a supporting position to the rear of the formation. Escort by the fire team is performed in the same manner as platoon escort, except as shown in figures 29 and 30 below.

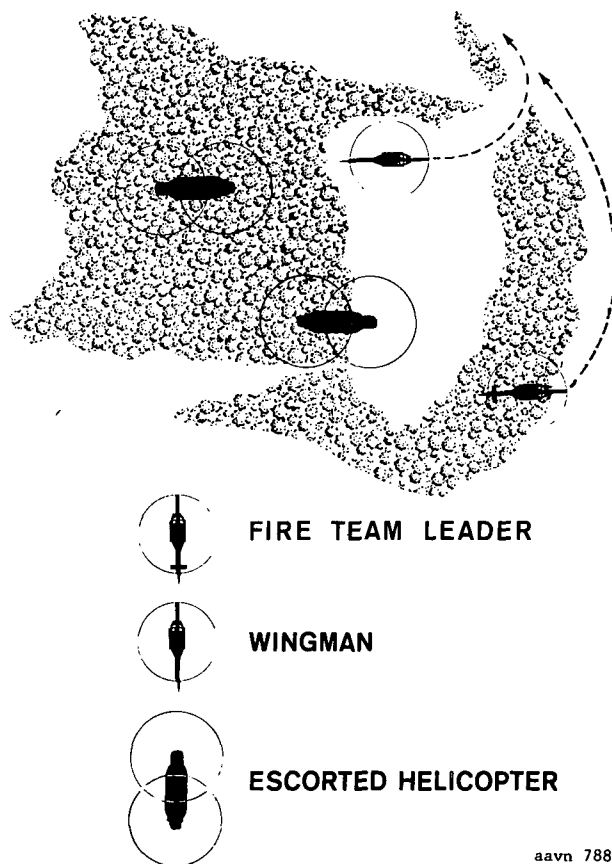
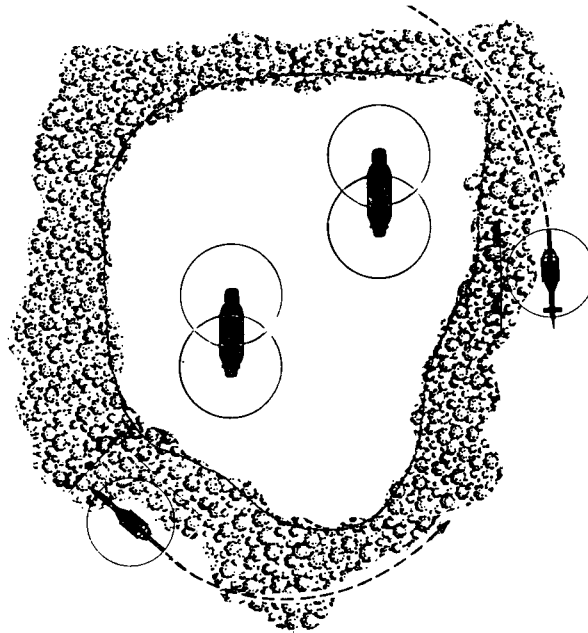


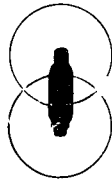
Figure 29. Fire team escort in the landing zone.



FIRE TEAM LEADER



WINGMAN



ESCORTED HELICOPTER

aavn 789

Figure 30. Fire team single protective orbit.

APPENDIX V

OPERATIONS ORDER FORMAT FOR ARMED HELICOPTERS

1. Situation.

a. Enemy forces—composition, disposition, location, movement capabilities, and indications.

- (1) Enemy density and disposition of forces.
- (2) Enemy organic and supporting weapons.
- (3) Enemy antiaircraft capabilities.
- (4) Identification of enemy units.
- (5) Probable enemy course of action.

b. Friendly forces—mission of next higher unit, location and mission of adjacent units and supporting units.

- (1) Aviation transport units.
 - (*a.*) Number and type of aircraft employed and unit designations.
 - (*b.*) Number of lifts.
 - (*c.*) Takeoff times.
- (2) Ground units.
 - (*a.*) Designation, composition, disposition, and unit designations.
 - (*b.*) Mission and plan of maneuver.
 - (*c.*) Objectives.
 - (*d.*) Ground control measures (boundaries, phase lines, checkpoints, etc.).
- (3) USAF and other air support.
 - (*a.*) Number and type of aircraft.
 - (*b.*) Mission.
 - (*c.*) Special instructions.
 1. Armament and ammunition load and weapons capabilities.
 2. Target acquisition and observation capabilities.
 3. Priority of fires.
 4. Duration of support.
 5. Contact instructions.
 6. Actions of armed helicopters upon entry into operational area of high performance aircraft.
- (4) Artillery.
 - (*a.*) Location of firing batteries.
 - (*b.*) Fire support plan (general).
 - (*c.*) Ammunition type and amount available.
 - (*d.*) Fire request instructions.
- (5) Other friendly forces.

c. Attachments and detachments—time effective.

d. Weather briefing.

2. Mission—concise statement of task to be accomplished by the unit and its purpose.

3. Execution.

a. Concept of operation—how the mission is to be accomplished.

b. Specific duties of subordinate elements.

(1) Flight routes, checkpoints, LZ's, other control measures.

(2) Loading plan—to include type and number of aircraft in each serial of the flight. Time sequence of loading and phasing will be given in coordinating instructions.

(3) Landing plan—to include approach azimuth, departure route, number of aircraft in each serial, time sequence, and priority of support. Prestrike plan and zone security will be given at this time.

(4) Plans for subsequent lifts—to include refueling, rearming, and maintenance information. Locations for each serial upon return will be stated. Arrangements and priority for all servicing requirements (food, fuel, armament, ammunition, maintenance, medical, and crew adjustments if required due to casualties) will be stated.

c. Task for attached elements.

d. Coordinating instructions.

(1) Formations.

(*a.*) En route.

(*b.*) Landing.

(*c.*) Escort.

(*d.*) Prestrike.

(2) Flight routes.

(3) Altitudes.

(4) Time frame. Times for each serial and lift will be given as—

(*a.*) Ready time (aircraft and crews).

(*b.*) Start time.

(*c.*) Communications check (if allowed).

(*d.*) Taxi time.

(*e.*) Arming time.

(*f.*) Takeoff time.

(*g.*) Time over each control point.

- (h) Prestrike or attack time (if used).
- (i) Landing zone touchdown time.
- (j) Staging area landing time.
- (k) Ready time for subsequent operations.
- (5) Critical headings (if used in air assault operations).
- (a) Final approach (to include turn if used).
- (b) Landing.
- (c) Departure.
- (6) Special instructions.
- e. Downed aircraft and crew procedures.
- (1) Special pickup and escape and evasion instructions.
- (2) Changes in unit SOP.
- (3) Closest friendly unit and current evasion pickup points.
- f. Operational reports.
- 4. Administration and Logistics.
- a. Administrative and logistical reports.
- b. Class I.
- c. Class III(A). Refueling instructions.
- d. Class V(A). Rearming instructions.
- e. Medical evacuation.
- f. Other.

- (1) Maintenance—aircraft and armament.
- (2) Special equipment (night, over-water, survival, morphine, etc.).
- 5. Command and Signal.
- a. Signal.
- (1) Air-to-air signals and recognition devices.
- (2) Air-to-ground signals to include pyrotechnics and special aircraft recognition devices.
- (3) Ground-to-air signals to identify friendly units, enemy locations, or medical evacuation requirements.
- (4) Call signs.
- (5) Primary and alternate radio frequencies (FM, UHF, VHF).
- (6) Codes.
- (7) Special contact instructions.
- (a) Restrictions to communications.
- (b) Air Force, artillery, ground unit, contact instructions.
- (c) Actions upon enemy jamming.
- (8) Time check.
- b. Command.
- (1) Location of mission commander.
- (2) Assumption in chain of command.
- 6. Special instructions—to include any changes to unit SOP.

GLOSSARY

airmobile staging area—A general locality between the mounting area and the objective of an airmobile expedition, through which the expedition or parts thereof pass after mounting, for refueling, regrouping of aircraft, and/or exercise inspection, and redistribution of troops.

armed helicopter mission commander—The individual who has been designated to command an armed helicopter force which is performing a particular mission. If an entire armed helicopter unit is operating on a specific mission, the unit commander normally will act as the mission commander.

buffer zone—That area immediately adjacent to friendly troops into which the armed helicopters will not fire.

force commander—The individual designated to command all the forces engaged in a specific operation.

free cruise—A flight formation characteristic which allows the formation to be changed or to change directions easily. Free cruise is achieved

by positioning the helicopters so that each helicopter can move from its position in the formation without requiring another helicopter to change position. Free cruise, as applied to armed helicopter formations, allows each aircraft commander to maneuver his helicopter to gain maximum advantage of terrain, compensate for maneuvers of the leader, and maintain continuous fire support.

parking location—The designated point within a refueling/rearming area to which the armed helicopters normally will make a direct approach and touchdown to receive fuel and to rearm.

refuel/rearm area—The area specifically designated for refueling and rearming armed helicopters. It may or may not be located within a servicing area or staging area.

servicing area—An area where any one or a combination of the following services will be available: refueling, rearming, minor maintenance, medical aid, rations, or others as deemed necessary.

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By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

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NG: State AG (3); units—same as active Army except allowance is one copy to each unit.

USAR: Same as active Army except allowance is one copy to each unit. For explanation of abbreviations used, see AR 320-50.